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The Veterinary Profession and a Pure Milk Supply.

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It is, perhaps, particularly appropriate that the subject of a pure milk supply should be considered by us at our meeting in Somerset, for not only is it a great dairy county, but it has as its Chief Medical Officer of Health, Dr. W. G. Savage, one of the best known specialists on this subject and whose work has been of the greatest service to our profession and the public. It is interesting to note that his "Milk and Public Health," published ten years ago, was dated from Weston-super-Mare, a town within a few miles of our meeting place.

Within recent years systems of recording the quantities of milk produced by individual cows have come into vogue, and it is considered of sufficient public interest to publish in London daily newspapers the fact that such and such a cow has produced 2,000 gallons of milk in a single lactation period; indeed, it appears to be the ambition of the breeders of one particular class of cattle to get cows of their own special breed to as nearly as possible approximate and even exceed that extraordinary yield. The physique of such cows and that of their progeny must deteriorate by such unnatural forcing, and detrimental effects would ultimately be produced on all our breeds of milking cattle if this were generally adopted. At the present time there is a much larger percentage of tuberculosis among our heavy milking breeds than in other classes of cattle.

By persistent efforts to increase excessively its milk yield the vitality of an individual is lowered, its susceptibility to infectious disease is increased, for its powers of resistance are lessened; apart from such constitutional effects the local effects are marked, the udders of heavy milking cows and of heavy milking breeds are particularly prone to abnormal and diseased conditions.

The state of filth and disease under which it is permissible in this country to produce and distribute milk is something of a disgrace to the authorities who are responsible for the public health.

The whole of the proposed legislation from Mr. John Burns' Bill of 1913, down to the Bill presented to Parliament by the Minister of Health in May, 1920, recognised the very important rôle which our profession should undertake in securing a pure and healthy milk supply.

The Milk and Dairies (Consolidation) Act, 1915, provides for the appointment or employment of veterinary inspectors, and confers on them considerable responsibilities. The operation of this Act was postponed by Parliament until one year after the official termination of the war, and should therefore have come into force not later than August 31st, 1922.

It was in expectation of this Act coming into operation that the writer accepted the invitation of your Local Committee and prepared a paper to put before this meeting, but on 20th June last a Bill was presented in the House of Lords by Lord Onslow and ordered to be printed which seeks to further postpone the operation of the 1915 Act until the first day of September, 1925, and makes no provision for taking advantage of the services of the veterinary profession during the intervening period.

Only one clause of this Bill (Sec. 5) deals with the milk of diseased cows; it runs, "No person shall knowingly by himself or by any servant or agent, sell or offer, or expose for sale the milk of a cow suffering from tubercular disease of the udder," whereas the Act which it postpones makes illegal the sale of the milk of any cow which has given tuberculous milk or is suffering from emaciation due to tuberculosis, or from tubercle of the udder, acute inflammation or suppuration of the udder, actinomycosis of the udder, anthrax, or foot-and-month disease, and makes further provision for extending this list. This new Bill is almost incredibly weak in view of the existing public anxiety as to the pureness of its milk supply. The increased charge on the public funds which would be incurred by the 1915 Act is the only possible excuse for its postponement.

The Medical Officer for the City of London, in his Annual Report for 1921, says: "I think it is a matter of very serious concern that it is possible to purchase in the City of London fifty consecutive samples of milk and find that one in four of these milks is tuberculous." Further, in his report he says: "I am satisfied that the obligation should rest on the farmer to ensure the milk he supplies to the public is free from infection and that it should not be necessary for any public body first to discover that infected milk is being sold and then to notify the farmer in order that suitable remedial measures may be adopted after the dangerous milk has been consumed by the public."

That the public can thus be afforded opportunity of consuming infected milk during the period of

time this roundabout process of discovering the diseased animal which is producing it is an evil which would be obviated or very appreciably lessened by periodical veterinary inspection of all cows used for the public milk supply.

Tuberculosis exists in our dairy cows to a greater extent than in pre-war days—the present ratio has been estimated at from 40 per cent. to 60 per cent.—by far the greater proportion are affected to only a slight extent and it is unreasonable to suppose that the milk of those cows which have only slight lesions can in any way be prejudicially affected by the presence of, say, a small lesion in a lymphatic gland or other organ apart from the udder.

Such a large number of cows are infected to this slight extent, and therefore show a reaction to the tuberculin test, that it would be impossible to keep up the necessary milk supply of this country if the milk of reacting cows could not legally be used, neither is it desirable from a public health point of view that such milk should not be consumed.

The danger to the public from the use of milk of slightly affected cows is in the incidence of tubercular disease. In such cows the disease either becomes arrested or it may progress, and its progress is usually slow and chronic, but earlier or later the period will arrive when the milk of an individual cow, if she is not meanwhile sent to the butcher, becomes unsafe for human consumption. The timely recognition of the arrival of this dangerous condition is difficult to determine even by a scientific observer, but by physical examination of the animal and the employment of scientific tests, the details of which are well known to the modern veterinary surgeon, he is able to determine when an individual cow should no longer be used for dairy purposes. The employment of veterinary skill is essential both in the interests of the consumer and producer of milk.

In March, 1920, the Food Controller of the Ministry of Health, for the purpose of providing a supply of cow's milk of high hygienic quality which should be absolutely reliable and safe for the food of infants and children, made a Regulation which provides that no person can advertise or sell any milk under the designations of "Grade A Milk" or "Grade A (Certified) Milk" except under licence from the Ministry of Health. A licence permitting the use of such trade designations is granted only to producers and distributors of milk who comply with certain regulations to the satisfaction of a representative of the Ministry or of a Local Authority acting on its behalf. Such regulations provide for the proper "equipment" of premises and "methods" of management of cows.

The chief difference in the requirements for "Grade A Milk" and "Grade A (Certified) Milk" is that although no special bacterial count is insisted on in "Grade A," "Grade A (Certified) Milk" on examination at any time before delivery to the consumer must not contain *B. coli* in 1/10 c.c. (in each of two tubes) or more than 30,000 bacteria per c.c., and must not be delivered to the consumer more than two days after the day of production.

Provided that the producer is an educated man, has sufficient financial means at his command, and has a staff with some technical knowledge, the Ministry's requirements as to method and equipment can be and are easily carried out; but the further condition, which provides "that during the period for which the licence is granted the herd from which the milk is obtained must contain no cow or heifer in milk or in calf or other bovine animal kept in contact with the herd which has not passed the tuberculin tests as specified," presents a great difficulty—indeed, for the production of such milk on a big scale from a numerous herd, an almost insurmountable difficulty.

For many years, except during the war period, the writer has been concerned, either personally or in an advisory capacity, in attempts to maintain dairy herds in which all the cows will pass the tuberculin test, and has found, except in small herds, such a condition to be unattainable except for a short period of time; but in all cases he has had to deal with herds in which the number is maintained by the purchase of fresh cattle, he has never dealt with herds numerically kept up by home-bred animals from non-reacting parents.

In 1914 a nobleman* actuated by philanthropic motives, started a herd of cows with the object of supplying milk from non-tuberculous cows to the public. None but cows which had passed the tuberculin test were admitted to the herd, and periodical testings by the subcutaneous method were carried out during the war time and up to March, 1920.

During these six years the reacting cows are stated to have been about five per cent., and the cases of doubtful reaction seven-and-a-half per cent. All reactors were immediately disposed of, and doubtful cases segregated and re-tested.

In March, 1920, the Ministry, as the condition of a licence to sell Grade A (Certified) Milk, insisted that the double tuberculin test, *i.e.*, the subcutaneous and the ophthalmic tests, should be applied simultaneously to all cows, and the members of this herd were subjected to the double test.

The reactions to these simultaneously applied tests were in some cases divergent and contradictory, and the result of this double test of the herd was disappointing both to the veterinary surgeon and the owner.

All cows showing reactions whether to the subcutaneous or ophthalmic tests or to both tests were disposed of, but two healthy-looking cows which were segregated and re-tested at various periods were submitted to post-mortem examination for the purpose of comparing the value or reliability of the two different methods of testing; these were "Claret," a red shorthorn, and "Liza Jane," a roan shorthorn, both about five years old.

The records of these cows and post-mortem results are as follows:—

*Viscount Astor.

"CLARET."

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
19-3-20	102	102	101·4	101·8	—
14-5-20	101·4	101	101·8	101·6	102
29-6-20	101·8	101	101·6	101·2	101·2

At each of these testings, although she passed the subcutaneous test, she failed in the ophthalmic—lachrymation, conjunctivitis and muco-purulent discharge from the eye being present throughout the testing period. On 20th July, 1920, she was tested by the ophthalmic method only, and again failed.

In August she was again subjected to the double test, passed in the subcutaneous, and failed in the ophthalmic.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
15-8-20 Pasteur 4 c.c.	101·2	101 Lachrymation and conjunctivitis marked. Half tea spoonful of muco-pus at and around inner canthus.	101 Lachrymation and discharge of muco-pus increased, eye apparently painful, slight swelling below lower eyelid.	101·2 Lachrymation severe. No muco-purulent discharge	101·4 Eye much improved. Slight lachrymation only.

Post-mortem examination ten days later revealed tuberculosis—the pharyngeal lymphatic glands on both sides, the laryngeal on right side and one submaxillary lymphatic, were affected—there was a large caseous nodule in the right lung and a mediastinal lymphatic gland was caseous and gritty on section.

"LIZA JANE."

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
27-5-20	101·4	101·2	102	102·2	101·6
29-6-20	102	101·2	102·2	103	103·2
29-6-20		Muco-purulent discharge throughout.			

On July 20th she was tested by the ophthalmic method only and again failed. In August she was subjected to the double test, passed in the subcutantaneous, and failed in the ophthalmic.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
15-8-20 Pasteur 4 c.c.	101	101·2 Lachrymation down side of cheek, conjunctivitis. Half a teaspoonful of muco-pus.	101·6 Lachrymation and conjunctivitis, increased muco-purulent discharge.	101·2 Eye much improved, fresh muco-purulent discharge.	101·6 Lachrymation, conjunctivitis and muco-pus slight.

Post-mortem examination showed well marked tubercle in the right pharyngeal lymphatic gland; no other lesion was found. Attention is invited to the frequent intervals at which these cows were tested: "Claret" had been subcutaneously injected four times in five months, and "Liza Jane" three times in three months. It seems probable that immunity to the subcutaneous test had been conferred by prior testings. The ophthalmic tests were positive and unaffected by previous testings. The right eye was used for the last tests; the left eye had been previously used.

In contrast to these two results the history of a similar apparently healthy cow, "Ladybird," is interesting.

"LADYBIRD."

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.	21st hour.
10-9-20	101·2	100·8	101	101·2	101·2	—
23-4-21	100·4	102	102·6	104·8	104	103·4

On both these occasions the ophthalmic test was simultaneously employed, but no reaction took place, the eye remaining clear throughout the testing periods.

Post-mortem, 10th May, 1921.—One small tubercular lesion was found in a mesenteric gland, no other lesion was discovered. The lesion was submitted to Sir John MacFadyean, who reported, "On microscopic examination of a piece of the mesenteric gland I found that the lesion in it was tuberculous, it was partly caseous and calcification had begun in it."

It will be observed that although in these three cows there was a discrepancy in the result of the tests themselves the total result was correct—each animal failed to pass the combined test, and each of them proved tuberculous.

Of interest is the record of another cow tested in the same date which had passed both tests simultaneously in the previous October.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.	21st hour.
23-4-21	101	102	100·8	101 Muco-purulent discharge	102 Muco-purulent discharge	103·6

She was isolated and re-tested in August.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
20-8-21	102	102 Slight lachrymation and muco-purulent discharge.	103 Slight lachrymation and muco-purulent discharge.	102·6	102·2 Lachrymation and muco-purulent discharge.

Post-mortem on 22nd August revealed tubercle in one pharyngeal lymphatic gland, no other evidence of tuberculosis.

As before indicated, this herd was tested as required by the Ministry every three months, all animals which reacted to either test were at once segregated

or disposed of, and all doubtful ones segregated and re-tested; and as has already been shown this immediate segregation and disposal of doubtful and reacting animals had been carried out in this herd for six years and no fresh cow was ever admitted to the premises unless it had immediately previously passed the tuberculin test. Notwithstanding all these efforts the result of a double test simultaneously applied in April, 1921, of the whole herd, was surprising:

Number of cows tested 117
Number of cows passed both tests 62
Number of cows which failed to pass ... 55

Of those which failed to pass, 37 cows reacted and 18 were doubtful reactors. All the reacting and doubtful cows were isolated on a distant pasture or disposed of. The 62 cows which passed this combined test were turned out into meadows and only brought into a shed for milking. The whole of the cowsheds and buildings were cleansed and disinfected.

Four months later, viz., in August, 1921, the 62 cows which had passed were with 21 freshly-purchased cows* again subjected to a fresh test as prescribed by the Ministry. The result was even more alarming than the previous test.

Number of cows tested 83

Nine were subjected to the ophthalmic test only, eight passed and one failed, and 74 were subjected to the double test.

Number of cows passed both tests 38
Number of cows which failed in both tests 10
Number of cows which failed in ophthalmic test only 15
Number of cows which failed in subcutaneous test only 1
Number of cows which passed the subcutaneous, but were doubtful in the ophthalmic ... 10

So that out of this frequently-tested and presumably tubercle free herd only 46 cows could pass both tests, and moreover the cows had meanwhile all been kept in the open air; they, except possibly in the case of the newly-purchased cows, had been at grass since the previous testing.

So large was the number of freshly reacting cows that suspicion was aroused as to the tuberculin which had been used; could it have contained living bacilli? This was negatived by the fact that no local swellings had ever been observed at the seat of the subcutaneous injections, also the tuberculin used had been obtained from two different sources.

Then the reliability of the tests was questioned, and to determine this the owner offered any of the cows for post-mortem examination. Six apparently healthy but reacting cows were destroyed and their carcases examined.†

Two cows, "Duchess" and "Girlie," which had failed in the April testing, were first taken; they were not tested in August, but had meanwhile been segregated, indeed, one of them, "Duchess," had been segregated for over a year. Between 16th March, 1918, and 23rd April, 1921, this cow had been subjected to the subcutaneous test eight times and had on each occasion passed, but failed in the ophthalmic test when simultaneously applied on the last four occasions.

"DUCHESS."

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
19-3-20 19-3-20	102	101 Muco-purulent discharge throughout.	102·8	101	101
29-6-20 29-6-20	101·6	101 Muco-purulent discharge throughout.	101	100·4	100·2
17-11-20 17-11-20	101·4	100·6 Conjunctivitis, muco-purulent discharge.	101·2 Conjunctivitis, muco-purulent discharge.	101·6 Conjunctivitis, muco-purulent discharge.	101 Conjunctivitis, lachrymation, muco-purulent discharge.
23-4-21 23-4-21	101	101 Muco-purulent discharge throughout.	101·4	100	101·4

Post-mortem ("Duchess.").—Tubercle was present in the pharyngeal, mediastinal, bronchial, mesenteric and hepatic lymphatic glands, and in both lungs and the liver. At the date of slaughter her bodily condition was good and her age about eight years.

"Girlie," an aged cow, passed the subcutaneous test on 16th May, 1919, and the subcutaneous and ophthalmic tests simultaneously applied on 19th March and 29th June, 1920.

Her testings in April, 1921, were:—

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
20-4-21 20-4-21	100·4	100	100·4 Muco-purulent discharge.	101	103 Muco-purulent discharge.

Post-mortem ("Girlie"), made nearly seven months later, showed a caseous abscess the size of a walnut in the right pharyngeal lymphatic gland and tubercular lesions in the left bronchial and mediastinal lymphatic glands.

Four cows which had failed in the August test were next taken: "Veracity," "Windsor," "Majority," and "Cowslip."

"Veracity" had passed both tests simultaneously applied three times within the ten months ending 2nd May, 1921, and failed in both tests in August, 1921.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
18-8-21	103	103·4 Muco-purulent discharge.	104 Profuse muco-purulent discharge, conjunctivitis and lachrymation.	104·2 Ditto.	105·4 Conjunctivitis and lachrymation.

* The pre-purchase tuberculin tests were made by several veterinary surgeons.

†There were present at these post-mortem examinations, representatives of the Ministry of Agriculture and Royal Veterinary College, Mr. Wooster, M.R.C.V.S., the writer and other veterinary surgeons and public health officials.

Post-mortem (" Veracity ").—Tubercular lesions were present in the right bronchial and posterior mediastinal glands. Lungs and other organs apparently free.

" Windsor " had passed both tests simultaneously applied in August and November, 1920, and on 2nd May, 1921, passed the subcutaneous, but as her eye was suspicious of reaction she was segregated and again tested in August.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
2-5-21 2-5-21	101	100·4 Slight muco-purulent discharge and conjunctivitis.	101 Slight muco-purulent discharge and conjunctivitis.	101 Eye clear.	101 Eye clear.
17-8-21 17-8-21	101·2	101 Muco-purulent discharge, lachrymation, conjunctivitis.	101·4 Slight muco-purulent discharge, lachrymation, conjunctivitis.	101 Lachrymation, conjunctivitis.	100·6 Muco-pus, lachrymation, conjunctivitis.

Post-mortem (" Windsor ").—At the base of right lung was one tubercular lesion the size of a hazel nut, and numerous caseous calcareous lesions in posterior mediastinal lymphatic gland.

" Majority " had passed both tests simultaneously employed five times between February, 1920, and May, 1921, but failed in both tests in August, 1921.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
17-8-21 17-8-21	102	101·2 Muco-purulent discharge, lachrymation.	103·6 Muco-purulent discharge, conjunctivitis, lachrymation.	105·2 Muco-purulent discharge.	106·2 Muco-purulent discharge, conjunctivitis, lachrymation.

Post-mortem (" Majority ").—One well marked small tubercular lesion in mediastinal lymphatic gland. No further lesions found.

" Cowslip " had passed both tests simultaneously applied on three occasions between September, 1920, and May, 1921, but failed in both tests in August, 1921.

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
17-8-21 17-8-21	102	101·2 Muco-purulent discharge.	102 Muco-purulent discharge, lachrymation.	102·6 Conjunctivitis, lachrymation.	103·6 Muco-pus, lachrymation.

Post-mortem (" Cowslip ").—Pin-point areas in mediastinal lymphatic gland; these lesions were subjected to a microscopic examination by Mr. Leslie Sheather, B.Sc., who reported the existence of definite tuberculosis. No further tubercular lesions were found in this cow.

All the foregoing six reacting cows had been selected for slaughter not on account of the qualities of the reactions they had shown, but because either from not being pregnant or from being comparatively poor milkers they were less valuable to keep alive than others.

Further cows were offered for post-mortem, but it was felt that the reliability of the tests had been sufficiently established. One other cow (" Susan ") was, however, subjected to post-mortem examination; she had passed the subcutaneous test in August, 1921, but at the 9th and 12th hours had shown a trace of muco-purulent discharge at the inner canthus, while at 15th, 18th, and 21st hours her eye was quite clear. It was thought desirable to determine if this very slight accumulation of discharge should be regarded as a reaction. Mr. Wooster, who had made the test, considered it should not. No tubercular lesions were found in the carcase.

There was a further inducement to post-mortem this cow. She had at a subcutaneous test in May, 1919, shown a sudden jump followed by an equally sudden marked fall in her temperature—no regular temperature curve was shown and the jump was regarded as accidental and not due to tuberculosis—this opinion was justified after an interval of two years.

" Susan."

Date of Test.	Initial Temp.	9th hour.	12th hour.	15th hour.	18th hour.
6-5-19	101·6	102	102	104·2	102·6

The absolute necessity of simultaneously applying both the subcutaneous and ophthalmic tests where possible is shown by the cases which have been quoted, also the opinion for so long held that frequent injections of tuberculin confer some immunity to its action when used subcutaneously is confirmed, hence in a number of cases an ophthalmic reaction is obtainable in a tuberculous animal although there is no reaction to the subcutaneous test.

The seven years' continual testing of this herd shows the enormous difficulty to be encountered in the establishment and upkeep of a tubercular-free herd of heavy milking cows although all newcomers to the herd are tuberculin tested and the hygienic surroundings of the animals are the best, and every known precaution is adopted to prevent the access of infected animals.

In two other large herds used for producing high-grade milk there has been to my knowledge similar trouble with reacting cows.

It appears that apart from the millionaire who does not mind financial loss the only person able to maintain a herd qualified to obtain and keep the Food Controller's licence for Grade A (Certified) milk is the individual who has two or more farms, who can continually remove and replace reactors in his licensed herd by interchange with his other herds, and he would in the course of time, in keeping up his Grade A herd, also form a Grade D or even lower category herd.

The unsuccessful attempts to obtain tubercular-free herds in this country is apparently the reason why the General Medical Council of the Ministry of Health has appointed a committee of scientists to investigate the subject of tuberculin testing of cattle. Although we as veterinary surgeons will regret that except in so far as the actual application of the tests is concerned the veterinary profession is not represented on the committee, we shall all hope that some of our difficulties will be removed and much benefit result from their labours and investigations which we hear are now in progress.

The difficulties of the veterinary surgeon making the tubercular test are very great.

To be in a position to give a correct interpretation of the result of the test needs the expenditure of considerable time, great care and observance of detail, and it must not be overlooked that these difficulties are often increased by the action of vendors of cattle or other interested persons.

A veterinary surgeon making the test should be prepared to devote twenty-four hours to each testing. For the sake of his client, his own reputation, and the reputation of the tuberculin test, he should not undertake the work unless he can either personally make the observations or have them made by a reliable assistant. To allow cowmen to make the temperature records or to be satisfied with an insufficient record of post-injection observations cannot be too strongly deprecated.

There can be no justification for the action of a veterinary surgeon who would pass animals as free from tuberculosis on a temperature record taken on two occasions only subsequent to the subcutaneous injection. For this test the temperature records should be taken at the 6th and 3rd hour previous to injection and at the 9th, 12th, 15th and 18th hour subsequent to injection, and in those exceptional cases where there is a slight rise at the 15th hour followed with a still further slight increase at the 18th hour it may be necessary to take further observation at the 21st hour. A rise of temperature of 2° must be accepted as a reaction, provided the rise and fall are both gradual; a sudden jump in temperature to this or a greater extent accompanied by an equally sudden fall to about normal should be regarded as possibly due to some accidental disturbance of temperature; the animal can only be regarded as suspicious and re-tested later on.

For the ophthalmic test observations should commence at the 6th hour subsequent to the application of the tuberculin and continued to the 18th hour or even longer. When the eye shows conjunctivitis, marked lachrymation or the discharge of muco-purulent matter—the untested eye being at the same time bright and clear—a reaction is established, and in my experience the animal may safely be regarded as tuberculous. In doubtful reactions from either test the advantage of simultaneous double testing is shown. A decided reaction to either test is sufficient evidence of the existence of tuberculosis, and the animal should be rejected.

In the charts shown in this paper the ophthalmic test shows itself to be more reliable than the subcutaneous. Sir John MacFadyean, in comparing the reliability of the methods of testing, says, "Our experience compels us to give the preference to the subcutaneous method."*

It has been pointed out that the failure of the subcutaneous test may be attributed to its too frequent application—the three months' interval between tests insisted on by the Ministry of Health is certainly too short.

A decided reaction to the subcutaneous test is often followed by a period in which the animal will not react to further injections, and advantage is taken of this by some owners, who give a dose of tuberculin to their cattle a week or so before the official tests are made.

Cowmen also will endeavour by depriving the tested animals of water to increase their thirst and then allow them to drink before the temperatures are taken, knowing that drinking cold water may lower the temperature; this effect, however, soon passes, and it is advantageous that a reacting animal often will not drink.

Muco-pus can easily be removed intentionally or accidentally from the eye and the effects of lachrymation obscured.

But apart from artificial difficulties there are many others which the veterinary surgeon has to consider. In all animals for a variable period after infection tuberculin will not produce a reaction. Excitement caused by removing animals into unfamiliar surroundings or from their usual fellows or calves, œstrum, approaching or recent parturition, travelling, exposure at markets, etc., may all upset the thermal records.

Rest and quietude of the animals are essential to successful testing.

Then, again, it often happens that an animal badly affected with tuberculosis will not show any reaction to the subcutaneous test. The writer has on several occasions found cows affected with tubercular mastitis pass this test; fortunately, other indications of the nature of the diseased condition can usually be found, and there is the ophthalmic test available to assist diagnosis.

Of a third method of tuberculin testing—the intradermal—the writer has little experience, but in the only three cases where reaction was marked, and where a post-mortem examination was made by him, the accuracy of the test was confirmed in each case. This test is somewhat similar to the intradermal mallein test so well known to army veterinary surgeons, except that with tuberculin the skin of the eyelid is not generally used as the seat of injection, that of the under-surface of the root of the tail, "an anal fold," being the usual seat of the operation; also the indication of reaction is different. An early transient swelling which disappears by the 12th or 15th hour is not regarded as a reaction; a persistent swelling diffuse or well defined when compared with

*Journal of Comparative Pathology, vol. xxvii., p. 372.

the anal fold at the opposite side of the tail lasting two or three days is a positive reaction. Luckey, an American observer of large experience, says, "In a general way the reaction to the intradermal test is best marked at the 72nd hour,"* and further that "the outstanding characteristic of a reaction to the intradermal test is the length of time the swelling persists."*

Tuberculin is not infallible—it has its limitations. Whereas a positive reaction to either of the three tests indicates fairly positively the existence of tuberculosis, a negative reaction to either of these tests when separately employed is not absolute evidence that an animal is free from tuberculosis. It seems to be generally recognised that under favourable circumstances the subcutaneous test is the most reliable of the three, but it is the most likely to be influenced or rendered inoperative by unfavourable circumstances. MacFadyean lays down that, except where there is a high or unstable temperature in the animal to be tested, "the proper course is to test simultaneously by all three methods, for the combined indications which can be thus obtained afford a far surer guide to correct diagnosis than the result of any one method applied by itself."†

Apart from tubercular diseases and the various forms of mastitis, there are other diseased conditions of milking cows which deserve official recognition. The eruption on cows' teats commonly known as cow pox, although not true vaccinia, is a contagious disease liable to spread rapidly in a herd, but capable of control under proper supervision. To my knowledge it has on more than one occasion been associated with septic throat in persons consuming the milk of affected cows.

Within my practice this eruptive disease of the teats of his two cows was associated with diphtheria in a client's household. "The cows yielding the milk were found to be suffering from an eruptive disease of the udder, and both from the lesions and from the milk cultures of virulent diphtheria bacilli were isolated. The pathological condition in the cows preceded by a short interval the onset of the disease in the (human) patients. It is conceivable that pathological lesions in the cow, such as those described, if infected with diphtheria bacillus, might form a suitable nidus for its growth and permit of the infection of large quantities of milk over a considerable period."‡ The eruptive disease of cows' teats concerned in the historical outbreak of scarlatina in connection with a dairy at Hendon was of a precisely similar character. In some years this condition of the teats is quite prevalent, particularly in the late autumn.

Then there is the septic condition of cows frequently found where the placental membranes are abnormally retained, also those in which a putrid vaginal discharge arising from the same cause will deluge the posterior part of the udder and tail, some of which must inevitably find its way into the milk-pail.

* Devine's Bovine Tuberculosis, p. 93.
† Journal of Comparative Pathology and Therapeutics, vol. xxvii.
‡ Drs. Dean and Todd, of the Lister Institute, in Journal of Hygiene, vol. ii., part 2.

The Central Chamber of Agriculture is in favour of bringing the 1915 Act into operation as it stands, but there can be no doubt that its veterinary inspection clauses are being opposed by the dairy trade generally. Even the National Clean Milk Society, which has done an enormous amount of good work, wishes the Act amended, and appears to rely on the pasteurisation of milk offered for sale in preference to veterinary inspection. This is the more extraordinary as the Chairman of this Society is quoted as saying, "At least 99 per cent. of London milk could only be sold in New York for cooking or for manufacturing purposes"*; while on the other hand the Chairman of the Milk Committee of the National Farmers' Union, who was recently sent out to the United States to investigate milk-producing methods, says, "In America there is a good deal more inspection on farms than there is here. Altogether milk production and distribution are on a higher plane than they are in this country."†

It is perhaps not putting the point too strongly to say that some individual members of the medical profession appear to look upon veterinary surgeons as interlopers in the matter of a pure milk supply, and would only invite their help as a last recourse.

Is it not our duty to endeavour to overcome all such antagonism from professional gentlemen, agriculturists or milk traders? This can best be done by making ourselves proficient in all duties which we may be called on to undertake in helping to supply pure milk to the public, by exercising great care and our best skill in all our inspections, and, perhaps just now most of all, in devoting all possible time and using our best powers of discernment in carrying out tuberculin tests.

The writer is indebted to Captain Pepper (Lord Astor's estate agent) for statistical material, and to Mr. Wooster, M.R.C.V.S., of High Wycombe, for his assistance.

Discussion.

The Chairman said he was sorry to hear that Col. Brittlebank was unable to be there to open the discussion, and he had sent his remarks, which he would now read, to Mr. Stableforth.

Col. J. W. Brittlebank: I must first of all express my thanks to the Provisional Committee for asking me to open the discussion on Mr. Villar's paper, and at the same time must express my regret to all concerned that I am unable to be present to open the discussion in person, but pressure of duty makes it impossible for me to leave Manchester.

I heartily sympathise with Mr. Villar in that he has had to reconstruct his position to conform with the Milk and Dairies (Amendment) Bill now awaiting its third reading in the House of Commons—a Bill which quite obviously shirks responsibility for making the producer put his house in order and saddles practically all the liability upon the distributor. Those who, like myself, have to administer the enactments in force for the control of the sale of milk,

* Review of Reviews, May, 1922.
† Live Stock Journal, June, 1922.

as well as to inspect sources of supply, will know what this means. We know, for instance, that probably not less than 90 per cent. of the contamination in milk takes place at the farm, and that it consists chiefly of dung, but the milk dealer will be required to retail milk by which the public health may not be endangered, and will thus be compelled, in self-protection, to instal appliances by which milk may be cleaned and cooked.

Mr. Villar rightly deplores the fact that the new Bill makes no provision for the employment of veterinary surgeons, and here, I think he will permit me to say that I am quite sure that he is no advocate for the employment of veterinarians merely for the sake of finding them work, but is, like myself, convinced that only by the skilled and trained assistance which they are able to give, are we going to obtain anything like increased safety in the milk produced, and a diminished incidence of disease in the animals producing it. We must, in fact, make ourselves quite certain that the public interest must ever come first, and it is only when a proper and unbiassed examination of all the facts shows that we can render this special service that we have a right to claim it.

I accept most of what Mr. Villar says, without question, on the first five pages of his paper, and he then goes on, by the publication of the results of tuberculin tests, to show the difficulties to be met with in the attempted maintenance of tuberculosis-free herds. His figures and facts, indeed, only serve to confirm the work of other competent and experienced observers. At the bottom of page 14 he says, "The seven years continuous testing of this herd shows the enormous difficulty to be encountered in the establishment and upkeep of a tubercular-free herd of heavy milking cows."

I should have thought Mr. Villar would have unhesitatingly referred to it as a work of impossibility rather than have described it as a work of enormous difficulty, for where recruits to herds have to be imported I have never yet seen or heard of any herd, of any size, which has been kept continuously free from tuberculosis. I have no criticism to offer on the details of the tuberculin tests themselves, and have always been satisfied that, where a typical positive reaction has been obtained, it could be relied upon, but (and this I think is the crux of the whole question) having said so much, what more is there to be said? Are we satisfied that wholesale tuberculinisation of bovine animals is an economically sound proposition? Mr. Villar apparently gives no opinion beyond the expression, already quoted, that it is a question of enormous difficulty, even although animals are maintained under the very best of conditions and every possible precaution taken to prevent the access of infection.

Some of us are no doubt responsible for propounding views which, to say the least of them, in the light of further maturity and practice, we now say were ill-considered. I, for one, plead guilty to my share and am perfectly willing to admit that for many years I was a pronounced advocate of clearing herds with the aid of tuberculin, but I have now changed my opinion and am prepared to say for many reasons, that as a practical solution of our difficulties, I do not believe it to be sound.

We must, for instance, never forget that in dealing with the question under discussion the first consideration which arises is the financial one, on which the agriculturist has to be satisfied, and if what happens is as Mr. Villar has described on pages 9 and 10, then it will take a lot to convince him that he can make a living under such conditions. Let us for a moment turn to the history of what happens in herds reared absolutely free from exposure to risk of infection of tuberculosis and see what occurs if infection does get in. The history, as recorded by most of the reliable observers, is that in such conditions, where infection is accidently introduced, the disease spreads like wild-fire.

I can confirm this in my own experience. I had for some years before the war maintained a herd free from tuberculosis, the herd being entirely self-contained and not refreshed by any animals from outside. After the outbreak of war this could not be done, for reasons which I need not enter upon, and fresh tested stock were supplied as recruits, the work being apparently done with care. In a period of 15 months, with only one application of the test, 77 per cent. of the animals reacted to tuberculin, and the mixed milk of the herd was tuberculous.

There is, I think, an analogy in the case of man which may be instructive, for it is the recorded experience of more than one competent physician specially experienced in tuberculosis, that the town dweller is far more resistant to the tubercle bacillus than is the fine lusty man fresh from hill country who is suddenly compelled to live in infective surroundings in town, where infection may be said to be omnipresent.

If, then, I have read Mr. Villar aright as intending to sound a note of warning to the practitioner, I am glad to associate myself with him. The whole question is one of tentative enquiry by competent and trained observers, and these, in my opinion, can only be found in adequate numbers in the veterinary profession.

Many observers hold that small doses of tubercle bacilli may be beneficient and capable of conferring immunity. On the other hand, it is hardly a disputed fact that destructive tuberculosis is, as a rule, the result of long and continuous exposure to infection, the first to succumb being those who are under the greatest physical strain from either work, abuse, or debilitating disease.

We have much to learn from a close and searching examination of work done in connection with the occupational incidence of tuberculosis in man, and I am tempted to wonder what percentage of human beings would pass if subjected to the tuberculin test in large numbers, and whether anyone would say that each and every reacting person was a danger to his fellow—I presume just about as much danger as

was the cow "Ladybird," described by Mr. Villar, to her fellows.

Mr. Villar hopes that the enquiry undertaken by the Committee appointed by the General Medical Council of the Ministry of Health will result in some of our difficulties being removed. I fail to see what the difficulties are that we cannot understand, and I certainly deplore the fact that we have not, as a profession, been able to undertake such responsible investigation. I believe that the unfortunate error we have dropped into was due first of all to looking at the conditions to be dealt with from a wrong angle. We were content to accept the superficial evidence put before us, and instead of setting to work at the right end, by making exhaustive enquiry into the essential practical conditions necessary for the maintenance of animals in the very highest state of resistance, we were, like the rest of the scientific world, carried off our feet by the discovery of tuberculin, and in our enthusiasm for what was regarded as an easy way, quite overlooked the true doctrines of preventive medicine—probably in our case so much more difficult to apply than in man. For, of a necessity in animals, the living, working and sanitary conveniences all exist within the same four walls. How much greater, then, is the mass of infection present in the cowshed containing infective animals than in the infective human habitation.

The death-rate from tuberculosis in man has fallen most rapidly during the past two decades, and, no doubt, some part of this is due to the all-round steady improvement of social conditions, improved housing, and greater appreciation of the benefits of fresh air and light, but the chief cause of this rapid progress is the great work built up on Professor Cornet's investigations—the persistent removal of infective dust from infected houses and workshops, and the consequent reduction in the amount of infection.

Tuberculosis is one and the same disease in animals and man, despite the slight variation in the conditions found in various hosts or presented by the bacilli. It is a disease chiefly of housing propagated in dirt and darkness, and accentuated by overwork, vice, or anything imposing undue strain upon the animal economy, and the same predisposing conditions hold good wherever you look.

I would thus relegate tuberculin to its proper position as a valuable aid to diagnose and a toy for millionaires, and reiterate my plea to make some attempt to understand properly the problem before us.

I will not bore you by going into what I consider necessary, suffice to say for the moment that I am satisfied that great and valuable progress can be made in the direction of obtaining a safer and cleaner milk supply without the wholesale use of tuberculin, relying upon careful clinical examination, scrupulous cleanliness, and continuous keeping within bounds any chance infection by repeated and thorough disinfection, all results being controlled by frequent use of the biological test.

I fear that the opening of the discussion on this paper has been rendered less "interesting" by the fact that I agree so entirely with Mr. Villar, and venture to hope that what he has said may lead to much good. The profession is discredited enough on these great questions as it is, and I further believe that blind faith in the continued employment of measures which show such a large percentage of failures cannot lead to any progress, or useful service either, to agriculture or in the greater field of public health.

I repeat my thanks to Mr. Sidney Villar for his paper, and again thank the gentlemen responsible for the opportunity to express my views.

Mr. HUGH BEGG said that perhaps they would find it a little refreshing if he were to give a little constructive criticism. He thought it a little disappointing when they got a paper styled "The Veterinary Profession and a Pure Milk Supply" to find that the whole of the paper almost, fourteen out of twenty pages, centred round the tuberculin test. He did hope Mr. Villar would have dealt with something apart from it, since he was dealing with a pure milk supply. He found on page 1 that he specifically said, "The physique of such cows and that of their progeny must deteriorate by such unnatural forcing, and detrimental effects would ultimately be produced on all our breeds of milking cattle if this were generally adopted"—meaning of course, the stimulating of animals to a higher point of milk production. He, however, was candidly of opinion that they could raise the productive power of their herds in some districts by a gallon per day by proper breeding. They were still breeding from a lot of messy animals, which were just as subject to tubercle because they were not as big and firm as the good ones. They could certainly keep a tubercular-free herd by keeping them by themselves, breeding there and keeping one's own stock. He could tell them of certain Grade A milk producers in Scotland whose herds had only shown one reactor in the last year and a half, and all the animals had been tested twice in that time. He did not think there was in England any case yet of anyone producing Grade A certified milk ("Oh, yes.").

Mr. VILLAR: It is referred to in my paper.

Mr. BEGG said Lord Hamilton had begun to produce Grade A certified milk. There was a difference between Grade A certified and Grade A milk. One must be bottled, sealed and dated at the farm; whereas Grade A might be bottled on the premises of a wholesale distributor, and might have a very high bacteriological content. He saw he mentioned that, "The state of filth and disease under which it is permissible in this country to produce and distribute milk is something of a disgrace to the authorities who are responsible for the public health." He supposed Mr. Villar was referring to England (laughter). He thought in that sentence was contained the whole essence of one of their biggest duties. They had a great mission in enlightening even the medical profession with regard to the work

they had done in the way of making it possible for a clean, wholesome milk as well as a tubercular-free milk to be produced as had been done in Scotland. If once they established a herd free, he guaranteed they could keep it free. He had an opportunity of speaking to a number of medical officers who had not taken that interest in the milk supply for the children that they ought to have taken. He was certainly indebted to Mr. Villar for the points of view he had put into his paper. Their whole energies as veterinary surgeons should be directed to such matters as the construction of byres and the duties of owners as to foods, etc., and the grade of milk.

Mr. H. L. ROBERTS said there were two or three points Mr. Villar had omitted. In the first place, he did not notice the effort that had been made by the agriculturists themselves under the milk recording scheme. That scheme had been an education and a stepping stone to the farmer to the production of cleaner milk. On the other hand, he was somewhat disappointed that in quoting from the report of the Medical Officer of Health for London, the quotation was simply a short excerpt. He thought Mr. Villar might have gone further and told them that the milk which was collected by the officers of the local authority was conveyed from the Eastern Counties by railway during the summer months. To his mind that conveyed, as far as they in the Eastern Counties were locally concerned, a very terrible state of things. One heard speakers say that it was not altogether a question of tubercle in the milk which was the greatest factor in the production of a better milk supply. He disagreed when he was told that from the counties of Norfolk, Suffolk and Essex they could go to Liverpool Street and collect tubercular milk at the rate of one in twenty-four. Further, in the proposed amending Milk Bill there was only a vague obligation upon the producer of milk to produce tubercle-free milk, and he noticed with a certain amount of grim satisfaction, because he was too late, that in the House of Commons, on the second reading of the Milk Bill, Sir Watson Cheyne made a great effort to have the word "knowingly" deleted from the clause. The position to-day was that the veterinary profession would not of necessity be called upon by the local authority under the Milk Shops Order, but in exceptional cases the local authority, the county council, might unforced cause cows to be properly examined for tuberculous udder. And, if the veterinary profession was not told off to examine the cows for evidence of tuberculous udder, how on earth were agriculturists to know that their cows were giving tuberculous milk? They would, therefore, go on sending that away as fast as they had previously done. There was the other aspect of the case. A great many of their agricultural friends knew these things should be done, but it was only permissive. But as soon as the clause became law, and in that clause it was an obligation to remove cows suffering from tuberculous udder, they would most willingly support the authorities in their effort to produce tubercle-free milk. He was sure that, although cleanness of milk was almost paramount, they must not lose sight of the fact that in view of the high percentage of diseased milk sent from the country to London and other large towns they should do all they could to utilise the tuberculin test in their effort to eliminate the tuberculous cow. In a great many instances, it was most desirable one should adopt the double test, the subcutaneous and the ophthalmic test. They were very much obliged to Mr. Villar for giving them an opportunity of seeing these statistics and reports, and no doubt they in the country would benefit by his remarks. There was one other paragraph on which he would like to make one or two comments. On the last page Mr. Villar said: "It is perhaps not putting the point too strongly to say that some individual members of the medical profession appear to look upon veterinary surgeons as interlopers in the matter of a pure milk supply, and would only invite their help as a last resource." He thought another word ought to be substituted for the word "some." He thought that it should be the word "few." He did not think that, generally speaking, the medical profession looked upon them at all as interlopers. He thought it was, as Mr. Begg had insinuated, that some medical men had not, up to the last few months, realised that veterinary surgeons were supposed to, or did, know anything about tuberculous milk, and it had come almost as a revolution to some of them that tuberculous milk came from tuberculous cows. When they realised that the veterinary surgeon had as much interest in the production of non-tubercular milk, he was sure they would find they would have, in even the rural districts, the greatest possible support and the most loyal of colleagues with whom to work.

Dr. SAVAGE, Medical Officer of Health for Somerset, said as a member of the medical profession it was a great privilege to him to accept the opportunity of meeting them. He was one of those who held the opinion that the solution of this or any other question could only be satisfactorily answered and arrived at by the hearty co-operation of both professions. He had been a student of this milk question for over twenty years. He was not one of those who had realised there was a milk question in the last few months. He would say distinctly that in that period there had been no material improvement in the milk supply, generally speaking. It was a strong statement to make. The milk was just as dirty and just as liable to convey infectious disease, and just as tuberculous. We were not making progress. He was sure that the Milk Bill was not designed to make progress. It was largely an evasion; it was the putting off of doing anything that was really effective. He heard people say that clean milk would cost more money. He had always held the view that dirty milk was dear at any price. He felt that the paper was an extremely valuable one, but that the tuberculin side had been perhaps unduly emphasised. Of course, one must realise in speaking of a pure milk supply, there were two distinct things to deal with. The first was milk as a carrier of

disease, in which connection he mentioned an outbreak of diphtheria in Somerset of over 100 cases and nearly a score of deaths. Then, secondly, there was the question of tubercle infected milk. The death-rate from pulmonary tuberculosis, which was not conveyed by milk to any extent, showed a tremendous reduction, but the death-rate from other forms was just as high as it was twenty years ago, and these other varieties were largely conveyed by milk. It was a significant difference. Somerset went to a lot of expense in dealing with these cases. It would be far better to eliminate tuberculous milk. Coming to the third thing—what they spoke of as dirty milk—one heard people say there was no harm in it. It was the same comfortable position taken up thirty or fifty years ago when the great pioneers of sanitary progress tried to improve the general surroundings and not simply one particular thing. It was very difficult to say what specific harm dirty milk was doing, but he was convinced it was doing a great deal of harm. What view did he, as a medical man, take of the part the medical profession should play in dealing with this question of a cleaner milk supply? He thought one must recognise there were three methods available; bacteriological examination, general medical supervision, and veterinary supervision. He was strongly of opinion that as regarded veterinary supervision the veterinary inspector must be a whole-time officer. He would never recommend his authority to appoint a part-time veterinary inspector for the same reason that he should not recommend the appointment of a part-time medical officer. He did not think that the veterinary inspector in connection with the milk supply should be otherwise than whole-time, otherwise there might be a conflict between private practice and public duties. There was one other point regarding the question of cost; undoubtedly if they got a better supply it should cost a little more. They must distinguish, however, between the two costs—the cost of supervision and the cost of production. They knew that the cost of production should not be high. It did not require elaborate machinery. It required simply cleanliness. The cost of supervision would cost something. That was a proper charge which should be met quite apart from the milk supply, and it should not be thrown on the increased cost of milk. He thought the charge should be largely met from the Imperial exchequer because the supervision would be mainly for the urban districts.

Mr. W. S. STEVENS said he had three herds in his charge for producing Grade A certified milk or otherwise. One of these herds was an ordinary, everyday herd like they met anywhere. It was purchased by a wealthy man, and he started to eliminate tuberculous calves. The first percentage was very high, eight per cent., but ultimately they got a clean herd. For reasons he would not mention tests were conducted for six months, and one of the tests was taken before the cows went to pasture and one when they came in. For three tests they did not find any reactors. Then they had a dry summer, the summer before last, and to their great surprise they found four reactors. The only conclusion they came to was they got infected at grass. They ultimately decided that it was conveyed from the liquid manure tanks.

THE REPLY.

Mr. VILLAR said when he knew Col. Brittlebank was going to open the discussion he was delighted, because he thought that he certainly believed in the tuberculin test. Naturally he looked upon what Col. Brittlebank wrote in 1914. He thought that Col. Brittlebank had out-Heroded Herod, because, although he had pointed out there was an enormous difficulty in maintaining a tubercular-free herd, Col. Brittlebank said it was a work of impossibility. Mr. Villar emphasised the tremendous difficulties to be encountered and the unforeseen conditions met when they started as veterinary advisers to producers of Grade A certified milk. Mr. Begg said none of it was produced in England. He believed that it was being produced by upwards of a score of herds at the present time, and no doubt, if there was any success, financially, that number would very greatly increase and veterinary surgeons would be employed to carry out the tuberculin test. The last time he heard the number of herds was a score. Now Dr. Savage told him there were fifty-seven.

Mr. BEGG: Not Grade A certified.

Dr. SAVAGE: Yes.

Mr. BEGG: It might be Grade A.

Mr. VILLAR said it must refer to Grade A certified, because there must be a great many more who produced Grade A, which was absolutely common. There was no doubt that the question of tuberculosis was the greatest trouble; and there was a great deal more responsibility put on veterinary surgeons than upon anyone else in the production of Grade A certified. This was why he had specially made so much of the tuberculin test in his paper. For this reason. At the time he was invited to read a paper they were under the impression that the 1915 Act would come into force and that they as veterinary surgeons would have to assume a very great responsibility. So that now, really, on the question of tuberculous cows, veterinary surgeons had very little to do with clean milk.

The Diseases of Poultry.

A PLEA FOR THE PRACTITIONER'S ATTENTION.

By H. AYSCOUGH THOMPSON, JUN., Potter's Bar.

The increased interest now being taken by the profession in poultry diseases was exemplified by the excellent exhibit which was on view at the recent Conference at Bath. In the capacity of a humble "exhibitor" I had the pleasure of attending the meeting, and by kind permission of the Local Secretary, Mr. Stableforth, of inspecting the exhibit above referred to.

Having been a keen poultry breeder of both fancy and utility stock from very early days, I naturally regard any research made into the origin and course of the various diseases to which poultry are subject as a matter of first-

class importance, and feel sure that in welcoming the effort which is being made by the National Veterinary Medical Association and the profession at large in this direction, I am voicing the opinion of most keepers of feathered stock in the country.

The diseases of poultry are many and various, and in the light of our present knowledge, from the point of view of the practical poultryman, principally classify themselves into those which can be, or at all events are worth curing, and those which emphatically are not. In the first list may be placed such minor affections as scaly leg and insect pests generally, to be followed by white comb, gapes in chickens, colds, pneumonia, croup, and kindred complaints in birds of any value, egg bound or broken egg, where the shell and membrane can be extracted without much difficulty, and crop bound. In a valuable bird, liver complaints, if taken in hand early, can often be kept at bay or eradicated altogether by careful dieting and exercise.

With regard to the second category, I should unhesitatingly condemn any bird showing signs of tuberculosis in any form, or "going light," as it is so often called; any form of prolapsus "down behind" or dropsy may also be regarded as incurable. But in the case of a Spanish hen once in my possession, where a small amouut of tissue protruded from the vent, I succeeded in replacing this, and so far as I am aware the trouble did not occur again.

In dealing with those terrible scourges of chickenhood—coccidiosis and aspergillosis or "brooder pneumonia," the best cure for these can only be regarded as their prevention in the shape of absolute cleanliness everywhere, both in food and surroundings, from the earliest days. Brooders and coops should be well disinfected, scrubbed out, and sun-dried at least once a year, while twice a week all vessels used for food and water should be well scrubbed and washed and allowed to dry. With regard to feeding, while the best that can be procured should always be given to growing stock not allowed complete liberty, it should be borne in mind that a certain amount of "roughage" is necessary in order that the digestive organs may properly perform their functions. In the United Kingdom this is usually supplied in the form of middlings or fine sharps mixed for drying off purposes with soft foods of a more concentrated character, but I have heard of the same result being achieved in America by cutting up paper very small and mixing it with the food, though such a method would seem rather drastic from most points of view over here.

The present season has been admittedly a very bad one as regards chicken mortality in many parts of the country, and it is probable that coccidiosis, aspergillosis and the bacilli of white diarrhœa obtained a firm hold on the young stock in many places. It may be desirable, therefore, to wage a most vigorous campaign of cleaning and disinfection of all appliances and of ground which is destined for the accommodation of chickens or young stock of any kind in 1923.

My own experiences in chicken rearing this year were curious in many ways and may possibly be of interest. I hatched about fifty White Wyandotte and thirty-five Old English Game chickens, the former almost entirely artificially, the latter for the most part under hens. As regards the former, the mortality was practically nil, the very few I did lose being those hatched under a hen, and, of those five lost, I believe nearly all were killed by the hen thrashing them against the sides of the coop when scratching. The Old English Game looked very well until about ten days old, when my trouble began. They literally curled up and died at the rate of sometimes four a day; of the few I had in the brooder I lost more than half, while the mortality of those hatched under hens was much higher, being something like 80 per cent. As these were exhibition stock, of which I was entertaining high hopes when the autumn shows came along, I need hardly say I was very disappointed.

The symptoms in nearly all cases were slight, being evidenced principally by a drooping of the wings and tail, which caused what can best be described as a flat-sided appearance, lasting generally from a few hours to two or three days, when death ensued. In some of the young birds at ten days or a fortnight old the head and wings would for some hours before death be carried in a very extended position, so that the beak touched the ground in front, the chicken adopting, as it were, a semi-circular attitude. A loud and plaintive chirping was also heard, indicating that the bird was in some pain.

In the latter stages of the epidemic I tried pulv. catechu, as recommended in the National Poultry Journal. This I mixed in the soft food, but, owing to the appetites of the sufferers having greatly fallen away, I was unable to induce them to take any quantity of the food so treated. Had I adopted the course recommended at the Conference, and dissolved the powder in the drinking water, it is very possible that better results would have been attained.

As far as the attitude until recently taken up by the profession towards poultry is concerned, there are one or two factors in the position which have grown up of late years, and which I think deserve some attention. While it is quite true in many instances to say that individual birds are not worth attention and treatment by the skilled practitioner, it is as well to bear in mind that the Poultry Industry, both Fancy and Utility, has increased enormously in the United Kingdom during recent years, and is likely to develop still more in the future. This naturally leads to better and higher class birds being bred in greater numbers than was formerly the case, and with such, whether pedigree layers or show birds, worth in each case perhaps several pounds apiece, it can hardly be their owners' desire that when suffering from disease they should be condemned, until every reasonable effort has been made to save them. From the point of view of reproduction, good class stock are always worth expending a little trouble to save, and might it not be possible that a bird that has successfully weathered the storm of a severe illness might be of greater value as a stock bird on that account?

When all is said and done, the dog has always been regarded as a fit subject for the veterinary surgeon's care, and when so many food producing birds of a higher individual value than many a dog are kept, it is to my mind strange that at all events some of the care which the average dog would receive is denied them.

I feel sure that if veterinary surgeons would make it known that within surgery hours they are prepared, for a reasonable fee, to examine and treat feathered stock brought to them, that they would have little cause to regret having done so.

Horse Ousting Tractor in Canada.

The feature of the 44th annual meeting of the Ontario Veterinary Association was an address by Waye Dinsmore, of Chicago, secretary of the Horse Association of America, on the subject: "The Horse—Canada's cheapest Farm Power." Mr. Dinsmore, in calling for a more wide appreciation of the usefulness of the horse, not only on the farms, but by people generally, went on record as declaring that not only was the horse more efficacious than the tractor on small farms, but last-minute experience had indicated that on the bigger farms, both in Western Canada and the Western States, horses were more useful and efficient than tractors. He related that on the immense Noble Ranch in Alberta the tide had turned completely in favour of the horse. The tractors that had been quite liberally in use on that great ranch had now been discarded, and only horses were now utilized. The same thing, he asserted, had taken place on a number of the big farms in the Western States.

The Veterinary Record.
30th September, 1922.

THE NATIONAL MILK CONFERENCE.

A National Milk Conference, which has been convened by the National Clean Milk Society and other bodies interested in the public health aspect of milk production, is to be held in the Council Chamber of the Guildhall, London, on October 16th, 17th, and 18th, from 10 a.m. to 1 p.m., and from 2-30 p.m. to 5-30 p.m. each day.

Representatives have been appointed by the Council of the National VeterinaryMedical Association, and those of other public bodies will include those of the British Medical Association, the County Councils' Association, the Society of Medical Officers of Health, the Royal Institute of Public Health, the Royal Sanitary Institute, and the National Association for the Prevention of Infant Mortality.

The inaugural address will be delivered by the President, Viscount Astor, on Monday morning, October 16th, after which Sir Arthur Griffith-Boscawen, Minister of Agriculture, will take the chair.

Sir Stewart Stockman will read a paper on "Contagious abortion and other diseases of cattle" at the afternoon Session, and will be followed by Dr. Stenhouse Williams, who will open a discussion on clean milk. On Tuesday morning Sir Alfred Mond, Minister of Health, will occupy the chair, and there will be discussions on bovine tuberculosis and its relation to man, opened by Drs. Stanley Griffith and Nathan Raw, and on tuberculin tests by Captain S. R. Douglas, F.R.S. In the afternoon Viscount Elvedon will occupy the chair. On Wednesday morning, under the chairmanship of Sir Walter Fletcher, Professor Dreyer, Dr. Charles North, of New York, and Dr. Eric Pritchard will open a discussion on pasteurization of milk. In the afternoon, with Sir GeorgeNewman in the chair, Dr. Robert Hutchinson and Dr. Leonard Hill will open discussions on the food value of milk and its care in the home. Sir Daniel Hall and Professor Kenwood will introduce the question of the education of the public and of the dairy industry in regard to milk.

All matters for discussion are of serious moment to veterinary surgeons, and it is to be hoped that the profession will be well represented at this important conference.

Particulars may be obtained from Miss H. M. Williams, honorary secretary, National Milk Conference, 3 Bedford Square, London, W.C.1, or from the General Secretary, 12 Buckingham Palace Road, London, S.W.1.

Abstracts and Reviews.

Resistance to Experimental Trypanosome Infection.

The authors point out that there are four types of life-histories of trypanosomes in vertebrate hosts: (1) Non-pathogenic trypanosomes, such as *T. lewisi* in the rat. This trypanosome undergoes multiplication in the rat's blood for a period of 22 to 32 days. Multiplication then ceases, but trypanosomes remain very plentiful in the blood for a further period ranging from 7 to 100 days. After this the so-called adult forms disappear and the rat is immune. (2) Pathogenic African trypanosomes, such as *T. brucei* and *T. rhodesiense*, when grown in rats and mice exhibit a continuous type of infection, multiplication going on until the host dies. (3) The same trypanosomes when inoculated into guinea-pigs, dogs, etc., exhibit a relapsing type of infection, characterised by alternating periods of increase and decrease of parasites in the blood. (4) There is at least one species of trypanosome which does not reproduce in the blood at all, but in the tissues (*T. cruzi*).

These differences may be explained by assuming a peculiar type of constitution either in the parasite or the host. The life-history of *T. cruzi* is probably explained by the first assumption, the trypanosome being in reality a tissue parasite. In the other cases the underlying cause appears to be a condition (permanent or temporary) of the host.

The authors consider any of the conditions which are adverse to the parasite as "resistance," whether it be direct, as a result of special activity on the part of the host, or in any manner indirect. *T. cruzi* is not considered in this paper.

Any resistance to infection may result either in retarding multiplication or in destruction of the forms produced. A fairly accurate idea of the total resistance may be obtained by making daily estimations of the number of trypanosomes present per cc. If, however, means could be devised by which a measure of the rate of multiplication or the rate of destruction could be determined, the two types of resistance could be differentiated. The authors have attempted to devise means of determining comparatively the rate of multiplication, based upon the difference in variability in size of individuals taken from a population of trypanosomes undergoing rapid multiplication and from a population undergoing little or no multiplication.

The authors have adopted the method of obtaining a co-efficient variation which measures the deviation in percentages from the mean, and have used the coefficient of variation for the total length.

Working on these lines, they found that in rats infected with *T. lewisi* the arrest of multiplication and the later disappearance of trypanosomes are due to a resistance, the essence of which is a retardation of multiplication. Just as their resistance is reaching its maximum, the host suddenly develops a resistance which kills off most of the parasites in the blood. Those which remain persist for a variable length of time and are finally killed off suddenly.

In mice and rats infected with pathogenic trypanosomes the opposite condition is found to hold. No evidence of resistance on the part of the host leading to retardation of multiplication can be found. In some instances multiplication became more rapid as the infection progressed.

In the relapsing type of infection, such as that produced by pathogenic trypanosomes in dogs, no evidence could be found of a resistance being developed by the host resulting in a retardation of multiplication, but a resistance is developed which destroys a large number of the parasites after they are formed. "The fact that resistance in the non-pathogenic *T. lewisi* produces two different effects, whereas resistance in pathogenic species (if present at all) produces only one of these effects, indicates that in the non-pathogenic forms there is either an entirely different type of mechanism of resistance, or that there is a different type of mechanism super-imposed on the mechanism found in the pathogenic forms. It is interesting to note that Miss Robertson (1912) has brought forward considerable evidence to show that in *T. gambiense* in the monkey there is an endogenous cycle, in which phases of active reproduction alternate with phases of little or no reproduction. If this be true, it would indicate that this form in the monkey encounters much the same type of resistance as *T. lewisi* in the rat, except that in the latter case when reproduction ceases it never starts again. Miss Robertson's results indicate that *T. gambiense* in the monkey encounters a resistance midway between the type we have described in *T. lewisi* in the rat and the pathogenic species in the guinea-pig. Such a result would not be at all surprising, and with the growing evidence that *T. gambiense* can exist in certain mammals as a non-pathogenic parasite it may be possible to find a host in which this trypanosome encounters the same type of resistance as *T. lewisi* in the rat."

[Taliaferro (W. H.) and Taliaferro (L. G.). The Resistance of Different Hosts to Experimental Trypanosome Infections, with Especial Reference to a New Method of Measuring this Resistance.—*Amer. Jl. Hyg.*, 1922, May. Vol. 2, No. 3, pp. 264-319.—*Ex. Trop. Vet. Bulletin.*]

Live Stock and Horse Breeding Improvement in England and Wales.

Ministry's Report for the Year 1921-22.

Live Stock Scheme.—The aims and objects of the Live Stock and Horse Breeding Improvement Schemes of the Ministry of Agriculture and Fisheries, and the steps taken to secure them, were so fully described in the recently issued Report of Sir Daniel Hall on the work of the Intelligence Department of the Ministry for the two-year period ending 31st March, 1921, that it is not necessary to explain again the reasons for the Schemes or the lines on wheih they are conducted. Those interested in the Schemes and horse and stock breeders generally may, however, wish to know the results for the year ending 31st March, 1922, and to compare them with those of previous years.

The Live Stock Scheme has now been in operation for eight years, and a review of what it has accomplished in face of serious difficulties, to which full reference has been made in previous reports, amply justifies its inception and vindicates its continuation, notwithstanding the call for economy in every branch of national expenditure. The new importance given by the War to the live stock industry as a source of food supply, and the imperative necessity for improvement in the methods that have satisfied the non-pedigree breeder for so long, are beginning to be realised by the farming community. To meet this need the Ministry's scheme has sought to demonstrate the value of a good sire and has assisted farmers by means of grants to obtain the services of such animals at reasonable fees. It has also, by giving financial assistance to societies formed for the purpose, encouraged the keeping of milk records which enable farmers to weed out unprofitable cows and thus grade-up their dairy herds. How much the scheme has progressed on these lines will be readily seen from the figures given in this report. The location of so many approved sires throughout the country must have a beneficial influence on the type of stock reared, and a satisfactory feature of the scheme is the improvement in the sires provided and the readiness of farmers to pay higher service fees.

The Committee on National Expenditure—commonly known as the Geddes Committee—recommended very considerable reductions in the expenditure on the Live Stock Schemes, but after full consideration the Government decided that no "cut" need be made in the subsidy to Milk Recording, Bull and Boar Societies. In view, however, of the urgent necessity for reduction in public expenditure the Ministry had reluctantly to discontinue its grants this season to Heavy Horse Societies, but as the majority of the societies subsidised were not in an unsatisfactory financial condition and had learnt the value of using good sires and of co-operating to secure the provision of them, it is hoped that the societies will continue their good work even though financial assistance from the Ministry is no longer possible. In this connection it may be pointed out that the Heavy Horse Scheme was initiated in 1914 with the object, *inter alia*, of discouraging the use of the unsound travelling stallion whose popularity was mainly due to his low fee. As, however, the unsound travelling stallion has been driven off the road by the operation of the Horsebreeding Act, 1918, it will be recognised that the need for the Heavy Horse Scheme is not so great now as it was when originally brought into operation. Its discontinuance is nevertheless regretted.

The progress made by the Boar, Bull and Milk Recording Schemes is satisfactory.

Boars.—Further substantial progress has been made by the Boar Scheme during the year ended 31st March, 1922. There has been a slight fall in the average price paid for all breeds except Berkshire and Essex, in which cases there was a marked increase, but the numbers of boars of these breeds are small. The service fees again show an upward tendency and, as illustrating the sow owners' willingness to pay more for a good sire, the point is worthy of notice. Another interesting feature is the inclusion of four breeds that were not represented in the early years of the Scheme. It has been pointed out in previous reports that the Live Stock Scheme has had the direct result of the establishment of new herd books, and in this connection the Gloucester Old Spots and the Cumberland breeds appear to be growing in popularity. A Gloucester Old Spots Boar provided during the year had an estimated value of £100, which, with an Essex boar which cost a like amount, represents the highest figure for the year. As many as 161 boars cost as much as £20 or over.

Subsidised boars and their progeny have again scored many successes at shows.

Bulls.—After the successive decreases recorded in the number of bulls provided during the years 1919-20 and 1920-21 it is satisfactory to note that there was a very marked increase in the number available during the year ended 31st March, 1922. There was, as in the case of boars, a general decrease in the average prices paid for the various breeds, and a general rise in the number of service fees of 5s. and over. The highest price paid for a bull provided under the Scheme was £483 for a Shorthorn, while as many as 97 cost £100 or over. The fact that these high prices are paid willingly is evidence that the

objects of the Scheme are being more understood and appreciated. Premium bulls and their offspring have done exceedingly well at shows. Indeed, it was almost invariably the case that where subsidised sires appeared at shows they figured largely in the award list. The following instance may be noted as typical of many. At the Danby Agricultural Society's Show on 18th August, 1921, there was a large show of premium bulls from the district and practically all the prizes were carried off by bulls in respect of which grants had been made by the Ministry. In one class for which a special prize was given for scheme bulls there were 9 entries, and the Live Stock Officer was personally complimented by the judges on the good quality of the exhibits.

Heavy Horses.—In view of the decision that grants to Heavy Horse Societies are to be discontinued it is of interest to review briefly the operations of this section of the Live Stock Scheme since its commencement. There was a general increase in the number of stallions provided, and mares served up to and including the 1918 service season, and a gradual decline since that year. This decline is due mainly to the fact that many societies have prospered sufficiently well to enable them to carry on without further financial assistance from the Ministry. Fully eighty per cent. of the societies subsidised by the Ministry were formed for the purpose of the Scheme, and in the year under review only 14 out of 83 societies which received a grant under the Scheme were in existence prior to its commencement. Most of the societies are in a satisfactory financial position, and it is hoped that they will carry on without the Ministry's grant.

Sheep.—The limited financial assistance given by the Ministry in 1919-20 and 1920-21 to a scheme for the improvement of Welsh Mountain sheep was continued during 1921-22. Grants at the rate of 3s. 4d. per ewe served, up to a maximum of £10, were made to eleven societies in respect of 13 approved rams. 791 ewes were served, being an average of 61 per ram. The ram, ewes and the progeny are required by the Regulations to be earmarked. The average hiring fee of the rams was £10 6s. 2d. and the average service fee was 1s. 7d.

This scheme is very popular in the districts for which it was provided, and it is hoped to extend it as and when opportunity offers.

Milk Recording.—Notwithstanding any fears that may have existed as to the effect of the upward tendency of the cost of recording and particularly as regards the institution of a charge for certificates and the sudden drop in the price which the producer obtains for his milk, the Milk Recording Section of the Scheme has continued its progress. Six societies and 37,000 cows were added during the recording year 1st October, 1920—1st October, 1921. The movement has penetrated into practically every county in England, and in Wales where milk recording has more recently been taken up, there are only four counties not yet provided for.

The annual returns furnished by the 52 Societies for the recording year under review show that of the 97,903 cows and heifers recorded, 49 per cent. were animals which had been retained in the herds for the full year, and the average yield of these full-year cows was 6,562·95 lb.—a slight advance on the average for the previous year when the full-year cows, which represented 44 per cent. of the cows and heifers recorded, gave an average of 6,527·3 lb. The large influx of previously unrecorded cows at the commencement of the year has again tended to keep the average of full-year cows lower than may reasonably be expected in due course, but the averages shown compare very favourably with the general average of all cows in milk throughout the country, which, according to the finding of the Departmental Committee on the Production and Distribution of Milk was estimated at 436 gallons for the year 1918.

The following example of the great difference which exists between herds in their milk producing value is of interest. Two members of the same society had 42 cows each. All were recorded for the full year. The average yield of the 42 cows in one herd was 9,117 lb. and of the other 3,812 lb. The approximate difference in the total yield was 21,733 gallons, which at 1s. per gallon represents a difference of £1,086 for the same number of cows.

The charge which was placed on milk record certificates in accordance with the recommendation of Sir Beville Stanier's Committee resulted as was expected in a great decrease in applications for certificates: 4,374 certificates were issued as compared with 16,425 in the preceding year. The decrease is considerable, but the falling off of about 3,500 applications in respect of yields of less than 6,000 lb. affords little ground for regret.

The fifth volume of the Ministry's Annual Register of Dairy Cows with authenticated milk records for the year ended 1st October, 1921, contains particulars of 2,441 cows (belonging to 493 members) in respect of which certificates have been issued by the Ministry showing that they have yielded 8,000 lb. or more during the year, or an average of 6,500 lb. or more during that year and one or more preceding consecutive years. Thirteen recognised breeds or types are represented in the Fifth Volume, and there are in addition 142 cross-bred cows whose milk yields have reached the prescribed standard.

Of the 2,441 cows entered 2,028 gave over 8,000 lb. of milk during the year, and 413 were entered on an average of 6,500 lb. or over. Of the 2,028 cows which were entered on the one year's yield, 931 gave between 8,000 and 9,000lb. 521 between 9,000 and 10,000 lb.; 290 between 10,000 and 11,000 lb.; 147 between 11,000 and 12,000 lb.; 58 between 12,000 and 13,000 lb.; 37 between 13,000 and 14,000 lb.; 14 between 14,000 and 15,000 lb.; 13 between 15,000 and 16,000 lb.; 3 between 16,000 and 17,000 lb.; 6 between 17,000 and 18,000 lb.; 5 between 18,000 and 19,000 lb.; 2 between 19,000 and 20,000 lb.; and 1 over 20,000 lb.

The Calf Marking Scheme, which is an essential factor in the grading up of recorded cows, has now been taken up by 52 of the 55 Milk Recording Societies.

An examination of the financial statements furnished by societies again revealed an increase in the average cost per cow both to the society and to the member.

It is probably an indication of the commercial value of milk recording that this tendency toward increasing cost has not constituted a serious deterrent to the extension of the practice. This value has been frequently demonstrated by the prices realised at sales for recorded non-pedigree cows.

Association Reports.

Midland Counties Veterinary Medical Association.

Members of the Midland Counties Veterinary Medical Association decided that their August gathering should take the form of a picnic, to which ladies should be invited. Accordingly, a small committee was appointed to make the necessary arrangements, and the venue selected was Tewkesbury, by river from Worcester. The day was Thursday, August 31st, and a long spell of unsettled weather had a marked effect upon the attendance. Fortunately, the climatic conditions left little to be desired, and if the sun did not shine all the time, the weather was fine and fairly warm. In these circumstances a very admirable programme was much enjoyed, and there was nothing but praise for the promoters of the picnic. The company foregathered at Worcester Bridge Wharf, Worcester, where a specially chartered and commodious steamboat was in waiting.

The journey down the Severn occupied two hours and a half, and those who have travelled along this beautiful English waterway will not need to be told how delightful it was. The tint of autumn was already appearing on hill and woodland, and there was a glory in the ever-changing scenery that a mere writer in prose cannot hope to describe. The creature comforts of those on board were not neglected, and the President of the Association (Mr. Brennan De Vine), the members of the Committee and the Hon. Secretary (Mr. H. J. Dawes), did all in their power to make everybody happy. On arrival at Tewkesbury, the Lower Lode Hotel was made the headquarters of the party, and here an excellent luncheon was in readiness. Afterwards, the members of the Association remained behind for the transaction of some routine business, whilst the ladies crossed the ferry and explored the old-world town of Tewkesbury, with its historic Abbey Church. They were joined later by the gentlemen, and later returned to the Lower Lode Hotel for tea. The return journey was undertaken at six o'clock, and Worcester was safely reached at half-past eight.

The Attendance.

The following ladies and gentlemen were present :—The President (Mr. Brennan De Vine, of Birmingham), Mrs. De Vine, Master De Vine and Miss De Vine ; Mr. J. Martin (Wellington) and Miss Martin ; Mr. J. A. R. Jones (Gloucester) and Mrs. Jones ; Mr. J. A. McLauchlan (Stourport) and Mrs. McLauchlan ; Mr. A. B. Forsyth (Cannock), Mrs. Forsyth, and Miss Forsyth ; Mr. H. L. Pemberton (Bridgnorth), Mrs. Pemberton and Miss Pemberton ; Mr. J. W. Conchie (Kidderminster) and Miss Conchie ; Mr. W. F. Aston (Ludlow) and Mrs. Aston ; Mr. G. A. Banham (Stratford-on-Avon) and Mrs. G. Banham ; Mr. H. B. Hiles (Worcester) and Mrs. Hiles ; Mr. A. Renfrew (Broadway) and Mrs. Renfrew ; Mr. H. J. Dawes (West Bromwich), Mrs. Dawes and Miss Dawes ; Mr. S. M. Woodward (Birmingham) ; Mrs. Nicholls (Chaddesley Corbett) ; Mrs. Morgan (Bushley) ; Mrs. Steward (Hereford) ; Mr. L. C. Tipper (Birmingham) ; Mr. L. W. Heelis (Solihull) ; Mr. F. O. Taylor (Stratford-on-Avon) ; Mr. W. H. Brooke (Handsworth) ; Mr. J. M. Whyte (Tenbury) ; Mr. R. P. Holmes (Birmingham) ; Mr. J. Young (Birmingham) ; and Mr. T. N. Gold (Redditch).

Apologies for non-attendance were received from the following :—Professor F. Hobday, Messrs. W. Dale, W. J. Dale, W. Trigger, R. C. Trigger, R. H. Over, L. C. Maguire, E. Ringer, J. R. Carless, T. Chambers, Trevor Spencer, G. W. Howie, W. White, R. Hughes, W. E. Ison, W. Tart, J. Robertson, H. Tudor Hughes, A. G. Elder, W. W. Grasby, A. W. Findlay, J. A. Cormack, J. V. Steward, T. D. M. Martin, E. Franklin, J. A. Connell, H. S. Reynolds, C. F. Parsons, M. Sadler, Hedley Turner, F. Chambers, F. Cormack, H. W. Dawes, C. V. Dayus, F. L. Gooch, E. Hall, A. Mackenzie, R. L. Phillips, J. Thomson, H. Thornton and others.

Toasts at Lunch.

Before the company rose from the luncheon table, the President briefly submitted the toast of "The King," after which

Mr. Pemberton proposed the health of the President. He said Mr. De Vine was filling the office according to the best traditions of the Association, and the members were more than satisfied with their choice.

The toast having been enthusiastically drunk, the President suitably replied. He said that during his year of office he was trying to follow in the footsteps of the many distinguished members of the Association who had preceded him. He had a very high standard to maintain, and it was only possible to do so with the co-operation of every member. The attendance at the last quarterly meeting was most satisfactory, and he was no less delighted to see so many present on this occasion, considering the inclement character of the weather. However, the day's proceedings so far had passed off pleasantly, and he hoped the remainder of the day would be equally enjoyable.

"The Ladies," proposed by Mr. Banham and acknowledged by Mrs. De Vine, was another toast that was honoured, and Mr. Pemberton added "The Health of the Hon. Secretary," paying tribute to the great pains which Mr. Dawes had exercised to ensure the success of the day's outing.

Mr. Dawes thanked the company for their kind appreciation, and said he would be sufficiently rewarded by knowing that they had all enjoyed themselves.

The Business Meeting.

The President took the chair at the business meeting, which was brief. The minutes of the previous meeting were first read and confirmed.

Nominations for Membership.—Mr. Aston nominated for membership of the Association Mr. C. W. Loy, of Ludlow. The Hon. Secretary nominated Mr. J. A. McLauchlan, of Stourport.

The Late Mr. Alfred Over.

The Hon. Secretary said that since the last meeting of the Association they had suffered a very great loss by the death of Mr. Alfred Over, of Rugby. Those who were present at the last meeting and saw him taking the keenest interest, as usual, in the business of the day must have received a great shock when they read of his death in the *Record*. Mr. Over had been a practising veterinary surgeon for 61 years, and had been a member of that Association from the day it was founded in 1867. Nor had he been a silent member, but had attended the meetings regularly all that time and taken part in the discussions. In 1886 he was elected President, an occasion which he (Mr. Dawes) remembered well, because that was the year when he himself joined. A search of the old minute books would show how much the Association was indebted to Mr. Alfred Over. They were at one time in a very bad way, and several men set themselves to work to revive the Association, which threatened to become extinct.

Amongst them were the late Mr. Harry Olver, of Tamworth, Mr. R. C. Trigger, and Mr. Alfred Over. How far they succeeded could be gathered that day from the prosperous cond tion of the Association at the present time, when it was second to none in point of membership and influence.

The HON. SECRETARY at this stage read an extract from a letter he had received from Mr. R. C. Trigger, who recalled the late Mr. Over as he knew him 50 years ago. "He was a splendid horseman, looking as if he had been born in the saddle," wrote Mr. Trigger, "yet absolutely free from the horsey dress and horsey manners. He was an excellent practitioner, wonderfully up to date, whose high integrity and deep sense of justice gained for him the admiration of the entire profession and the confidence of all who knew him." The Hon. Secretary concluded by moving that a letter be sent to the family of the late Mr. Over, expressing the affection which every member had for him and the sorrow with which they had heard of his death.

This was briefly seconded by Mr. TIPPER, and carried *sub silentio.*

The HON. SECRETARY stated that a wreath was sent from the members of the Association.

Mr. Trigger's Bereavement.—The PRESIDENT said their old friend Mr. R. C. Trigger had recently suffered a bereavement, and would appreciate the sympathy of the Association. His sister, Miss Trigger, who had been his constant companion for very many years, had passed away. He moved that a letter of condolence be forwarded to Mr. Trigger.

Mr. PEMBERTON, who seconded, said he had known the Trigger family so long that to him Miss Trigger's death was in the nature of a personal loss.

The HON. SECRETARY spoke in similar vein, and the resolution was carried.

The Next Meeting.—The PRESIDENT announced that Dr. Graves, M.D., B.S., B.Sc., F.R.C.S., L.R.C.P., M.R.C.V.S., had promised to read a paper at the next meeting of the Association. Although it was not usual to hold the November meeting in Birmingham, he suggested that they should do so this year, partly out of compliment to Dr. Graves, who held an important appointment in Birmingham, and partly because it was central, and they might get a better attendance. He moved that the next meeting be in Birmingham. This was seconded by Mr. ASTON and agreed to.

It was further resolved that at the February meeting they should invite members to bring forward interesting cases that had arisen in their own practice, and the following intimated their willingness to do this: Messrs. Whyte, Renfrew, Aston, Brooke, Pemberton, Martin Young, Holmes and McLauchlan.

H. J. DAWES, F.R.C.V.S.,
Hon. Secretary.

Scottish Metropolitan Division.

A meeting of this Association was held in the Royal (Dick) Veterinary College on Thursday, July 6th, at 11 a.m.

The President, Mr. J. Henderson, occupied the chair. The members present included Messrs. A. Baird, J. Henderson, J. Aitken, P. Wilson, J. A. Matheson, Wm. C. Miller, W. S. Petrie, E. J. H. Sewell, A. K. Cameron, J. Brown, R. H. Connochie, W. M. Mitchell, A. W. Robertson, J. R. Greig, R. G. Linton, Major Stewart and Col. Lake.

Mr. W. M. MITCHELL, M.C., B.Sc., M.R.C.V.S., opened the meeting by giving a thoroughly practical and most interesting demonstration of the "Surgical Anatomy of the Air Sinuses of the Horse's Skull." Mr. Mitchell exhibited a number of prepared skulls and dissections, and explained the various methods of operating for pathological conditions. At the conclusion of Mr. Mitchell's address the members and visitors adjourned for lunch, following which the routine business of the Society was transacted.

The minutes of the previous meeting, having been published in the official journal, were taken as read and passed.

Messrs. A. L. Robertson, Arbroath, and J. G. Ross, Linlithgow, were elected to membership.

Mr. R. G. LINTON read a communication on "Some Harmful Foods met with in Practice," and exhibited a number of specimens.

[Professor Linton's paper will receive separate publication.—ED.]

Mr. J. RUSSELL GREIG made a demonstration of some two dozen British poisonous plants, which were shown in the living state. Attached to each exhibit was a card indicating its habitat, toxic principle, etc. In introducing his subject, Mr. Greig said:—This is a subject which is beset with difficulties, and I am afraid that many of these difficulties have their origin in the fact that we are extremely ignorant of the subject. There is a great lack of precise information in regard to the plants which are actually poisonous, and that is especially true of many exotic species cultivated in gardens. There is also a lack of precise information in regard to the extent to which a plant may be poisonous, because it is almost impossible—indeed it is impossible—to draw any hard and fast line between toxic and non-toxic plants, the degree of toxicity varies so greatly. Many plants may be regarded as noxious rather than poisonous, and it is only when they are browsed continually that any ill effects arise. It would seem that certain factors play a part in raising or lowering the degree of toxicity. In the first place, it is freely recognised that soil plays a very important part. There are some plants which in some parts of the country are non-poisonous, and these same plants in other parts of the country are deadly. Medicinal plants were introduced into this country during the war when there was a difficulty in obtaining alkaloids, and in Edinburgh experiments were made in growing these plants in various soils. They were periodically examined for their alkaloid yield, and it has been ascertained that the yield varies greatly according to the soil in which the plants are grown. Professor Linton's remark that very often when the plant is not growing luxuriantly the alkaloid yield is very much higher than

in cases where the plant grows well was interesting: that has been the experience of the Edinburgh people in their cultivation of medicinal plants. Again, climatic conditions appear to play a part in affecting the degree of toxicity. It has been shown in the case of several plants, the common hemlock, for instance, that in wet seasons, where it is growing in wet land, the alkaloid contained is very much greater than when the plants are growing on dry soil. Quite recently an eminent botanist told me that the common white clover, which is a valuable food plant in his country, is in certain parts of India deadly to horses. These facts may to some extent explain the difficulties experienced by veterinary practitioners when examining records of plant poisoning, because our literature on the subject is full of contradictions, some men stating that a plant generally accepted as being poisonous can be fed to animals without any ill effects.

It has been suggested that in many cases of plant poisoning it may not be the plant itself that produces the toxic substance, but that vegetable parasites upon the plant may be the actual cause of the production of toxin. Of course many plants are only browsed under certain conditions. In cold barren springs, when the grass is backward and short, plants such as the common hemlock (*Oenanthe*) will spring up green and succulent, will tempt sheep and cattle, and will be browsed, while if there be plenty of pasture they will not be looked at.

In winter time, when there is no pasture at all, it is common for stock to break through into plantations and browse the evergreens such as yews, daphnes, laurels, and so on. Professor Linton referred to another interesting point, namely, that some plants appear to possess for their own protection unpleasant odours or acrid bitter tastes, and for these reasons they are not browsed, and so come into fruition. One can understand why cattle would refuse such plants under ordinary conditions, but there are other plants which do not possess these characters, and which, nevertheless, are as a rule never touched by stock. It would almost seem that there is an instinct—call it instinct for want of a better name, although perhaps we do not know what instinct means—which enables animals to discriminate between toxic and non-toxic plants. That instinct is well recognised in wild animals, but it is not so pronounced in domesticated animals; nevertheless it exists. It is quite common, for instance, to find cattle and sheep grazing pastures surrounded by toxic plants, yew hedges, for example, yet these animals never touch yew hedges, but when other animals are first introduced into these pastures they are not so wise as their more experienced fellows; they browse freely and so become poisoned.

Professor Greig concluded his remarks by appealing to students and practitioners to record their observations on plant poisoning.

Exhibition of Skiagrams.

Mr. Wm. C. Miller exhibited a number of skiagrams and made the following introductory remarks:

With regard to X-ray work in animals, there are some very obvious difficulties that have to be kept in mind which prevent the best results being obtained, and it may be advisable to remind you of some of these at the outset. First of all, there is the impossibility of keeping the animal absolutely quiet; there is the impossibility of getting the animal to hold its breath, especially necessary when the chest and abdominal cavities are being exposed, and accordingly no definite outlines can be obtained of the region of the diaphragm. There is the timidity of the animal to be overcome, and the tendency to struggle when the exposure is being taken and the apparatus is sparking has to be guarded against. The only solution of some of these troubles is the administration of a general anæsthetic, but even chloroform anæsthesia will not immobilise the diaphragm, liver, and walls of the abdomen, which move with each respiration.

So far as dogs and the smaller animals are concerned the difficulties are not insuperable, but with horses and the larger creatures it seems at present as though X-ray work will be somewhat limited to particular cases. A factor which tends to prevent good results in the animals of large size, and which hardly applies in the case of the human being and the smaller varieties, is that the bones of the former are larger and thicker, and the distinction of the outlines of the shadows is much less acute. The potential necessary to pass through large masses of tissue is difficult to regulate and control. An idea of the strength of the rays used may be gathered from the fact that the Röntgen ray used to screen the pelvis of a pregnant draught mare will pass through three inches of solid steel. Another great handicap is that—so far as I am aware—no one is at present absolutely familiar with the normal appearance of skiagrams of animals, and still less are we able to translate and interpret the photographs obtained in diseased conditions.

At present the chief uses of radiography seem to be the accurate diagnosis of fractures, especially those that are deeply seated in masses of muscle or surrounded by swollen tissues, of calculi in the kidneys, bladder, stomach and intestines, and for the localisation of suspected foreign bodies in the throat, œsophagus, and intestinal tract generally. In human beings it is used for the diagnosis of diseases that are not obvious from the surface or from symptoms such as rheumatoid arthritis, osteitis, periostitis, and disease of the bone marrow, etc. In animals, particularly horses, where these diseases of bone and periosteum are very important, the difficulties are such that the use of the rays is not often a practical possibility. At the same time, I have no doubt that with suitable adaptation and with the perfection of details in the apparatus, with the necessary devotion of time to the study of the normal, and with a greater knowledge as to the nature and the application of the Röntgen rays, this branch of highly technical study has a great future and an extreme usefulness before it.

The Demonstration consisted of a complete set of the skiagrams illustrative of the normal appearance of the dog's body, many of the plates, especially those of the limbs, chest and abdomen, being duplicated so as to show various aspects. There were several showing fractures of the long bones of fore and hind limbs of the dog and cat; two of foreign bodies situated in various parts of the abdominal cavity of the dog; one was exhibited which showed the appearance of the limb bones of the dog in rachitis; a series of four showed the cranio-caudal as well as the transverse appearance of the carpus and the tarsus along with the extremities of the associated long limb bones of the horse: while the last two (added from a point of view of interest only) showed the normal and a dislocated metatarso-phalangeal joint from a reindeer. The cases had been encountered in the ordinary routine clinical practice of the College Hospital, and with the exception of the normal skiagrams exhibited which were specially taken, the X-ray photographs were taken for diagnostic purposes.

Notes and News.

The Editor will be glad to receive items of professional interest in these columns

Concerning Slaughtering.

At the Reading abattoirs recently a slaughterman was using the "humane killer" to kill a lamb, when the shot went astray and into his hand, the bullet lodging in the fleshy part He attended the Royal Berkshire Hospital, Reading, where the bullet was extracted, and for some time was an out-patient of that Institution. Another accident has occurred to a boy who happened to be in the abattoirs. A sheep was being killed when the bullet from the "humane killer" went through the sheep's head and ricochetted, striking the boy, who was nine feet away, and inflicting a wound just under the knee. Had the bullet struck the kneecap, the consequences might have been serious.

The number of local authorities who have adopted the Ministry of Health's model bye-law making humane slaughtering of animals compulsory is now 50, including many of the largest local authorities in the country. In addition to this model bye-law, which has formed part of the model series for several years, a new clause has just been introduced dealing with the bringing of animals to the place of slaughter, a process in which considerable cruelty may take place if proper care is not exercised. The new bye-law required that all persons engaged in bringing animals to slaughter in a slaughter-house shall, as far as possible, avoid driving them over pavements which have been made slippery with blood, and shall take such other precautions as are possible to avoid pain and suffering.

The Arsenic Situation.

Features of unusual interest are presented by the arsenic market at the present time, says the *Chemical Trade Journal*, and it is not at all improbable the near future will witness a shortage in supplies and a considerable rise in price of arsenic products. For the last ten months the price has fluctuated between £32 and £40, but within recent weeks a firming tendency has been evident, the most recent quotation for white arsenic being £41 per ton "free on rail, Cornwall." The Cornish output, which for 1919 amounted to 2,527 tons, dropped to below 2,000 tons in 1920, the last year for which figures are available. The production for the current year must be far below the 2,000 tons figure, and there is no doubt that had there been anything approaching normal conditions in the consuming industries or had there been a vigorous export demand, prices would be much higher than their present level. It seems possible now, however, that a considerable export demand will arise from the United States, where the consumption of calcium arsenate as an insecticide in combating the boll weevil in the cotton-growing areas has reached unprecedented dimensions. For the last six years the amount of white arsenic exported by England to America has been negligible, although in the year 1914 it reached 6,867 cwt. This has been due to the greatly increased American home-production, which rose from 3,132 short tons in 1911 to 11,500 short tons in 1921. During the present year this rate of output has not been maintained consequent upon the decline in the world-demand for copper, and the United States now finds itself faced with an actual shortage. We must look forward, then, to the United States as a serious competitor, in the near future at any rate for the limited supplies of arsenic in this country, and it would seem that an appreciable hardening in prices must follow as a natural consequence.—*Pharmaceutical Journal.*

Nine Ways to Kill a Veterinary Society.

Keep away from all the meetings, but kick hard about everything that is done.

If you should go to the town the meeting is held in don't trouble yourself about attending the sessions, but be sure to kick hard about the officers elected.

If you attend the session take no part in the discussion, but register your arguments to those sitting around and thus expound your wisdom and at the same time cause as much confusion and distraction from the speaker as possible.

If you are not appointed on any committee get sore, and if you are, take no part in its work.

Don't pay your dues promptly; make the secretary waste as much postage and time as possible before loosening up, and then try to send a check that will be returned marked: no funds.

Do not bother about getting new members, but tell everyone you meet that you have a notion to quit the association.

If the chair should ask your opinion on any subject say nothing, but after the meeting gather a group around you and tell them all about it.

Be sure to enter all sessions as late as possible, and especially while someone is addressing the meeting.

Go out two or three times during a session and induce others to follow. It might discourage the speaker enough to prevent him from coming again. —*Veterinary Medicine*, January, 1922.

Horse in Bronze.

Mr. Herbert Haseltine exhibited at Messrs. Agnew's galleries in Old Bond Street a number of

examples of his work in bronze. He is an artist with a delight in horses and an admirable talent for taking their likenesses. Among the subjects of his portraiture are King Edward's charger Kildare, Queen Alexandra's barouche horse Splendour, and King George's champion Shire stallion Field-Marshal V. A plaster model of the King of Spain on horseback is to be executed in bronze for the museum of the Hispanic Society of America. It shows King Alfonzo in military uniform, a dignified figure on a noble animal.

Of the portrait groups one of the most successful is that of the Meadowbrook Polo Team, lent for exhibition by Mr. H. P. Whitney. Reproduction must have made it familiar to many, but its liveliness and truth repay renewed study. Other polo subjects represent critical incidents of a game, and abound in vigour. Mr. Haseltine is not so happy when he turns to racing. "The Finish" fails to revive a moment of rush and excitement; for, though the jockeys are in energetic attitudes, the horses seem stiff and constrained, as though the bronze had been copied from an accurate but unspirited photograph.

On the other hand, the episodes of bull-fighting are masterly in the sense of reality they convey. That Mr. Haseltine has observed the bull, the horse, and the picador would be evident without the assurance that, by the kindness of the Duke of Alba and Don Antonio Miura (the breeder of the most celebrated fighting bulls in Spain), he was able to work for several months at a "ganaderia." These contests in bronze and polychrome wax are quite furious in intensity, and have a charm that is no less bizarre for being easily interpretable.

Mr. Haseltine's most ambitious productions are "Les Revenants," a bronze purchased by the Luxembourg Museum and shown by permission of the French Government, and "Field Artillery," a plaster model for execution in bronze. While there may be no intention to suggest that the first is a sequel to the second, one may be excused for seeing in them a kind of heroic tragedy in which horses play the leading parts. "Field Artillery" gives them straining every nerve to draw the guns down a steep and stony place, while in "Les Revenants" we see them, or other typical war horses, led in a long string, lean, worn, "done," their warfare accomplished, but no crowns of glory awaiting their devoted heads—a poignant reminder of the suffering entailed by the quarrels of men.—*The Times.*

Obituary.

Mr. W. Donaldson, Auchterarder.

Mr. Wm. Donaldson, M.R.C.V.S., Auchterarder, a well-known Perthshire veterinary surgeon, passed away suddenly at his residence in the course of last week. For some time Mr. Donaldson had not been in the best of health, but it was not thought to be anything serious, and the end was hardly looked for. A native of Paisley, Mr. Donaldson left his home county about forty years ago to enter on his duties in Perthshire. For some time he acted as V.S. to the County Council. He is survived by a widow and daughter.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Centenary Celebration of Royal (Dick) V.C. Foundation.

Sir,—As is doubtless already known to many if not most of your readers, the centenary of the foundation of this College falls to be celebrated in November, 1923. The success of whatever celebrations may be arranged by the Committee that is now being formed will depend in very great measure on the number of old students attending them, and it is confidently expected that all who have been in any way connected with the College will spare no effort to be present.

In this connection it has occurred to me to beg a small amount of your space in which to suggest to those who hold appointments abroad that they should keep the date in mind, so that, if possible, they may so arrange their leave home that it will coincide with the celebrations.

It will give me great pleasure to furnish all available details to enquirers, and I should esteem it a kindness if those who think they can be present will communicate with me, or the Secretary of the Centenary Committee (Professor Linton).—Yours, O. Charnock Bradley.

Royal (Dick) Veterinary College, Edinburgh.
28th August, 1922.

Abortion in Cattle.

Sir,—I have recently had an opportunity of enquiring into the ancient custom of keeping the goats with milch cows to prevent abortion. I have come to the conclusion that the results obtained are sufficient to justify enquiry.

The first thing to discover is, what the goat evolves in the shape of remedial agents.

Two friends of mine are trying to find out, and also are trying the effect of certain stink-producing organisms, when grown with Bang's Bacillus.

There is no reason why other workers should not lend a hand.

It is just possible that an organism may be found which will kill or inhibit Bang's Bacillus, and so make it possible to cure abortion by injecting such organisms into the circulation of infected cows.—Yours, J. Gregg.

Belfast.

Veterinary Science and Research.

A Reply to Dr. Adami.

Sir,—Referring to a column headed "Veterinary Work and Brains," in the issue of the *Liverpool Daily Post*, dated 14th ult., might I be allowed a little space to reply to some of the statements made by Dr. Adami at that interview? I do not wish to comment on anything which Lord Lascelles said at the Northallerton Agricultural Show beyond saying that his lordship has been misinformed about many points connected with the veterinary profession in this country. With regard to Dr. Adami's interview, one cannot come to any other conclusion but that it was a cheap advertisement. Dr. Adami wishes to revolutionise veterinary teaching in the British Isles, but the manner in which he attempts to bring about the desired changes does certainly not appeal to us generally as members of the veterinary profession. I do not say that changes are not desirable. We could do a great deal more useful work at our colleges and as a profession if capital were forthcoming—herein lies the whole crux. Our profession is hampered for want of the necessary funds. It is, however, to Dr. Adami's ways that I take objection. Some of his statements are not correct, and others only reveal *part* of the truth. I shall refer to a few of them as they appear in the report of the interview.

First of all he says, "that a better class of men take up Veterinary Science in Canada than here as a general rule—*excepting of course the students at Brownlow Hill.*" Are the Liverpool students really of a better class than those of the other four Colleges? It is a sweeping assertion and, to say the least, it is a disparaging one. Dr. Adami, his staff, and students will have to work very hard for many years before he can claim that distinction. Furthermore, is that particular student or graduate whom he mentioned by name even yet so very superior to his Liverpool confrères? If so, he really must be a marvel—in fact, almost a super-man; and yet I do not see that he has won any of the "blue-ribbon" prizes which can be won by veterinary students and graduates, such as the "Fitzwygram" and the "Walley" prizes. What about the other students of the Liverpool school? After all, they are only human, and likely to resent any one particular student being named.

Further, Dr. Adami states that "for ten years we have been granting B.V.Sc. degrees." So are the other Universities, and some of them long before Dr. Adami appeared on the scene. He also states that the Royal Veterinary College at Camden Town does give teaching as well as diplomas; that is not so. The R.V.C. does *not* grant diplomas—it is a teaching institution only. It is the R.C.V.S. that grants diplomas—being an independent and non-teaching institution.

I also fail to understand what Dr. Adami means when he says "that London and Edinburgh Universities have provided only partial veterinary Science courses." Further on still he states "that the Liverpool University undoubtedly leads in the forward development of Veterinary Science," and that "some of the students are among the brightest men we have." Facts, however, do not go very far to prove that statement, because, firstly, since the establishment of veterinary training at Liverpool, up to and including 1921, only one graduate of that School has won the first prize in the Fitzwygram Memorial Competition, and that was in 1919, whilst a second prize was won on one occasion, namely, in 1907. (The Fitzwygram prizes are awarded to the students of all Veterinary Colleges who, during their respective curricula, shall have obtained the highest and second highest aggregate marks in all professional examinations for the Membership Diploma.) Secondly, the Walley Memorial prize has never been won by a student of the Liverpool Veterinary School. (This prize is awarded to that one of the students of any Veterinary College in the United Kingdom who during the 12 calendar months preceding the award has passed his "C" or third professional examination, and has obtained in that examination the highest number of marks on the written questions in the subjects of Pathology, Materia Medica and Hygiene.)

In reply to the question, "Do your B.V.Sc.'s find ready employment in England?" he states, "many of them do. But Liverpool has a way of its own in path-finding and pioneering. Our B.V.Sc.'s are now to be found in India, Union of South Africa, East Africa, and many other parts of the world." I do not know the exact number of veterinary surgeons in India, excluding the officers of the R.A.V.C., but the percentage of Liverpool graduates found there is very small indeed, whilst of the 99 V.S.'s in the Union of South Africa, only three are from Liverpool, and of the 81 in other British parts of East and West Africa only three are Liverpool graduates. With regard to other parts of the world, which Dr. Adami had in his mind, of the 12 V.S.'s in Egypt there are none from Liverpool, of the 45 in New Zealand there are also none from Liverpool; neither is there a Liverpool graduate amongst those in the following places:—Straits Settlements, West Indies, Malta, Mauritius, Cyprus, Fiji Islands, Portuguese East Africa, Argentine, China, France, Germany, Madagascar, Palestine, Peru, Sandwich Islands, and Siam. There are, however, one in Brazil, one in Chili, and one in Venezuela; whilst the total number of V.S.'s in the 20 countries mentioned amounts to 44.

Of the 33 V.S.'s in the U.S.A. none are from Liverpool, and of the 55 in Australia only two are Liverpool men; and, finally, out of the 36 who are found in various parts of the Dominion of Canada not one is a Liverpool graduate.

Out of the total 419 Veterinary Surgeons on the Register, shown as residing outside the limits of the British Isles, not including officers of the R.A.V.C., only 12 are graduates of Liverpool, and, furthermore, not one of them, according to the same Register, is a B.V.Sc.; and yet Dr. Adami states that his B.V.Sc.'s are to be found all over the world. This is what Dr. Adami calls a way of their own in "path-finding and pioneering." He is really and truly doing his "little bit."

Generally speaking, we, residents of the British Isles, are inclined to be conservative, but we are the first to give credit where credit is due, and we generally judge according to results. When the Veterinary School of Liverpool can show results, Dr. Adami need not have recourse to interviews. The British public are good and fair judges, and Liverpool—a school still in its infancy—may yet—nay, will—make for itself an everlasting reputation, if it will set to and "produce the goods," but a reputation gained by artificial inflation will sooner or later burst like a child's balloon.—H. Llewelyn-Jones, M.R.C.V.S.

Denbigh, 21*st August*, 1922.

The following is the interview, reported in the *Liverpool Daily Post*, with which our correspondent deals in the above letter :—

Veterinary Work and Brains.

Liverpool University leads the Way.

Viscount Lascelles's criticism of the Royal College of Veterinary Surgeons, reported in Friday's issue, was read with interest in Liverpool University circles. In discussing the subject with a *Daily Post* representative, Dr. Adami pointed out that Liverpool University leads all other universities in the United Kingdom in the completeness of its course in veterinary medical science.

"Is Lord Lascelles right in stating that the Royal College of Veterinary Surgeons is mediæval in its views?"

"I am rather inclined to agree with the viscount," said the Vice-Chancellor. "He has been in Canada a good deal, as aide-de-camp to one of the Governors-General, and he has no doubt found that a better class of men take up veterinary science there than here as a general rule, excepting, of course, the students who take this course at Brownlowhill. For I can assure you we have some very able men among our veterinary graduates and undergraduates. Last year a veterinary student, Thomas Hare, who was president of our Guild of Undergraduates, has proved himself one of the best men at Liverpool University. So that

Lord Lascelles' argument certainly does not apply to such men as Mr. Hare, when he complains that this country wants 'a method by which the greatest brains in the country could be included' in the cause of veterinary science.

"For ten years we have been granting these B.V.Sc. degrees, and last year we had some fifty students in this department. These men are quite up to the standard suggested by Lord Lascelles. For the most part they have come from good country stock, and are keen, healthy, and intelligent chaps—a distinctly useful group in our university life."

Where Liverpool Leads.

"Wherein does the course at Liverpool University differ from, say, the course at the Royal College of Veterinary Surgeons, the Royal Veterinary College, and such universities as London and Edinburgh?"

"I am very pleased indeed that Lord Lascelles has brought this matter up, as it affords me the opportunity to put this thing right, so the public may understand just where Liverpool University comes in. In the first place the Royal College of Veterinary Surgeons grants diplomas, but gives no teaching. A man who gets a degree from such an institution may miss one of the finest features of mental training, that is the 'atmosphere' of university life. On the other hand, the Royal Veterinary College at Camden Town does give the teaching as well as the diplomas. London University provided a veterinary science course before we did, and at Edinburgh they have taught along similar lines, that is to say, both London and Edinburgh have provided only partial courses."

"Does Liverpool Univeristy stand alone in this forward development of veterinary science?"

"Yes, if you like to put it that way. We were the first in Great Britain to establish a full course in veterinary medical science and surgery, and in this respect we undoubtedly lead. The result has been that we have overcome long ago the difficulty spoken of by Lord Lascelles with regard to the quality of our veterinary students. Some of them are among the brightest men we have.

Liverpool Men Abroad.

"Do your Bachelors of Veterinary Science find ready employment in England?"

"Many of them do. But Liverpool has a way of its own in pathfinding and pioneering. Our B.V.Sc. men are now to be found in India, East Africa, South Africa, and in many other parts of the world; and I know, from what I have learned from time to time, that they are making good in those countries. The profession is a most useful one, and, as Lord Lascelles has pointed out, gives scope for brains as well as the other professions, and good men are needed to take it up."

"From your remarks, and those of the viscount, it might be gathered that England is not quite abreast of the times in veterinary education?"

"England as a whole is behind Canada and Australia and the United States in not affiliating its veterinary schools with the universities. That is one of the weak points of our present system. To show how complete our course in Liverpool is I may point out that five years' study is required to entitle a man to our B.V.Sc. degree, and the first two years of that course is precisely the same as is our medical course. In speaking up now Viscount Lascelles is doing a good work. His whole argument is one that we have long recognised at Liverpool University."

Diseases of Animals Acts, 1894 to 1914. Summary of Returns.

Period.	Rabies. Cases Confirmed. Dogs.	Rabies. Cases Confirmed. Other Animals.	Anthrax. Outbreaks confirmed.	Anthrax. Animals attacked.	Foot-and-Mouth Disease. Outbreaks confirmed.	Foot-and-Mouth Disease. Animals slaught'd as diseased or exposed to infection.	Glanders (including Farcy).* Outbreaks reported by the Local Authorities.	Glanders (including Farcy).* Animals attacked.	Parasitic Mange.* Outbreaks reported by the Local Authorities.	Parasitic Mange.* Animals attacked.	Sheep Scab. Outbreaks reported by the Local Authorities.	Swine Fever. Outbreaks confirmed.	Swine Fever. Swine slaughtered as diseased or exposed to infection
GT. BRITAIN.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended 16th Sept., 1922...	...	...	5	5	...	...	...	...	9	15	4	29	8
Corresponding Week in 1921	...	...	3	7	...	...	...	...	23	30	2	14	4
Corresponding Week in 1920	3	...	10	11	1	...	...	...	37	44	9	27	13
Corresponding Week in 1919	...	...	...	2	2	31	...	1	36	90	2	38	16
Total for 37 weeks, 1922 ...	1	...	371	425	1125	54906	2	2	856	1225	431	878	337
Corresponding period in 1921	22	1	371	481	43	2958	10	30	1791	2741	410	905	315
Corresponding period in 1920	13	...	305	369	73	9559	10	17	3080	5136	306	1457	580
Corresponding period in 1919	141	3	142	188	27	1588	19	47	4098	8245	224	1618	723

NOTE.—The figures for the current year are approximate only. *Excluding outbreaks in Army horses.

IRELAND.												
Week ended 16th Sept., 1922	...	...	...	...	...	...	Outbreaks ...	...	...	4		
Corresponding Week in 1921 ...	1	1	...	...	...	...	1	7	3	5		
Corresponding Week in 1920 ...	...	...	...	...	..	...	1	15	...	...		
Corresponding Week in 1919 ...	...	...	...	...	...	...	2	2	3	2		
Total for 37 weeks, 1922	1	1	...	...	...	...	68	149	174	961		
Corresponding period in 1921 ...	1	1	7	77	...	...	69	196	85	440		
Corresponding period in 1920 ...	1	1	...	...	1	3	85	217	8	25		
Corresponding period in 1919 ...	...	...	...	...	1	1	126	177	29	78		

NOTE.—The figures for the current year are approximate only.